OCTOBER 20, 1997 VOLUME 14, NUMBER 42

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

In the mood to MERGE

McAfee to snap up Network General for $1.3 billion. Page 8.

Local carrier ICG to unite with ISP Netcom. Page 9.

NICK KOUDIS

GTE rains on Bernie's parade

Local giant paints nice picture with MCI, but Bernie Ebbers' WorldCom may be better fit.

By David Rohde and Denise Pappalardo

The Herculean effort to cobble together a powerful end-to-end network and provide rich Internet capabilities last week took center stage, as local telephone powerhouse GTE Corp. put in a bid to buy MCI Communications Corp.

Observers said GTE's $28 billion cash offer for MCI, competing with WorldCom, Inc.'s recent $30 billion stock offer, probably spelled the end for the planned global supercarrier merger between MCI and British Telecommunications plc (BT).

It also opened the door to a bidding war between WorldCom, GTE and possibly others. Partisans for GTE, which recently modernized itself by acquiring Internet provider BBN Corp., said a GTE/MCI merger would provide a powerful counterweight to the regional Bell operating com-

See **GTE/MCI,** *page 94*

WHY DO YOU LIKE MCI?

Three giants are in a tug-of-war for MCI. Here's how they view MCI's...

	 **BT's** Iain Vallance	 **GTE's** Charles Lee	 **WorldCom's** Bernard Ebbers
...investment in local facilities	Fears required investment.	Provides new coverage in big cities.	Adds to MFS and Brooks Fiber local nets.
...Internet backbone	Complements Concert Internet Plus global service.	Could help fledgling GTE Internetworking group.	Could dominate market, if combined with UUNET.
...consumer business	Way to break into U.S. mass market.	Way to bolster long-distance position.	Secondary to MCI's business offerings.

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- **Official reactions from WorldCom and AT&T**

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TAKING NO CHANCES

Managers of lottery networks go to extremes to keep the games online.

By Evanthia V. Brickates

It was a stormy afternoon in Port Allen, La., in January 1995, when operators of the Louisiana Lottery network experienced the ultimate systems crash.

"A tornado suddenly peeled the data center roof straight off. You could look up from where you were sitting and see sky. It's fortunate no one was killed," says Steve Beason, vice president of software for lottery systems provider GTECH Corp., of West Greenwich, R.I.

See **Lottery,** *page 67*

Michael Collura *of the Massachusetts State Lottery is overseeing a $60 million project to keep the games online.*

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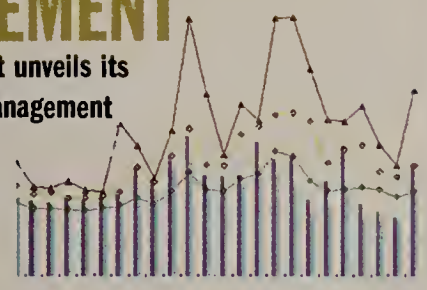
SPECIAL DELIVERY

Mitsubishi readies e-Parcel, an electronic file delivery service. Page 43.

BUSINESS-CENTRIC MANAGEMENT

Start-up NextPoint unveils its Web-based net management system. Page 29.



NEW LIFE FOR S/MIME

The Internet Mail Consortium's Paul Hoffman is hopeful about an open e-mail security standard emerging. Page 8.

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SPECIAL FOCUS

Multimedia applications

The word is spreading about IP Multicast. Page 48.

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This Week

Only on Fusion

Keeping Current. Of all the suitors for MCI, Fred McClimans likes GTE the best. He tells you why. **DocFinder: 4333**

Search engines. The 'Net's great because it offers so much information. The 'Net's terrible because it offers so much information. We've put together a guide to search engines that shows you how to quickly zero in on only the information you really need (instead of 52,000 links to bank ATM locations). Plus, we'll show you how search-engine companies and researchers are working to make their products smarter. **DocFinder: 4334**

Question of the week. "I have several Jet Direct Printers on an NT 4.0 (SP3) server. Occasionally, print jobs restart endlessly in the queue and thrash the hard drive on the server. It happens from different types of printers and with different versions of Jet Direct firmware. HP and TechNet are no help." Have an answer? Jump into our Help Desk forum and help out this reader. **DocFinder: 4335**

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News briefs, October 20, 1997

Wanted: Bay trade-ins

Bay Networks, Inc. has quietly initiated a trade-in program to migrate users of its Switch Node routing switch to the Rapid City — or Accelar 1000 — devices (*NW*, Sept. 29, page 1). Bay said the program is customer-specific. Randy James, vice president of development at Community First Bancshares, Inc., in Fargo, N.D., said Bay is buying back his Switch Node at full price.

Community First Bancshares also is replacing up to 10 Bay 28115 10M/100M bit/sec autosensing Ethernet switches with Accelar 1000s because the Accelar switches offer more functionality at the same price, James said. Separately, this week Bay is expected to detail the IP Services cornerstone of its Adaptive Networking strategy with a directory services partnership.

IBM retools network executive lineup

Rick McGee: *now on special assignment*

Donald Haile: *new VP of development*

IBM last week made official the appointment of James Vanderslice as IBM vice president and group executive of the Networking Hardware Division (NHD). He has occupied the role since the summer. Vanderslice will replace Lutze Hahne, who stepped down from the position for medical reasons.

Rick McGee, former vice president of strategy and business development for NHD, is now working on special assignment reporting to Vanderslice.

Donald Haile, former general manager of technical strategy at IBM's software group, is now vice president of development at NHD.

Building Web applications

Information Builders, Inc. this week will announce new versions of its EDA middleware packages aimed at enabling Web applications: EDA Enterprise Component Broker, a 100% Pure Java Application Server, and EDA Active X Server.

Enterprise Component Broker will enable Web application developers to create, deploy, reuse and integrate JavaBeans with Enterprise applications and data including CICS and IMS transactions and more than 70 proprietary databases.

Active X Server integrates news Microsoft Distributed Component Object Model-compliant applications with enterprise transactions, procedures, databases, and application packages.

Lucent buys Livingston

Lucent Technologies, Inc. last week said it would acquire remote access software provider Livingston Enterprises, Inc. for $650 million in stock. Livingston has strong ties to 2,000 Internet service providers and a large indirect sales channel that Lucent wants to tap, executives said.

New Eudora goes beta

Qualcomm, Inc., of San Diego, last week announced the availability of a public beta version of Eudora Pro 4.0 for Windows 32-bit platforms.

The upgrade includes support for Internet Message Access Protocol 4, Lightweight Directory Access Protocol and HTML message viewing and composing. Users of Eudora Pro 3.X or later may access the new beta at www.eudora.com/beta/epro4.html.

New bug found in IE 4.0

A group of German researchers have uncovered a bug in Microsoft Corp.'s Internet Explorer (IE) 4.0. The bug allows a Web site to obtain the contents of any text, HTML or image file stored locally on a machine running that version of the browser.

Users can employ the Security Zone features of IE 4.0 to prevent this or can download and install the patch Microsoft made available over the weekend (www.microsoft.com/ie/).

In-Site

Money for nothing; intranet for free

Kinko's retail chain makes money off its Internet-based corporate backbone.

By Tim Greene
Ventura, Calif.

If there really is such a thing as a win/win scenario, Kinko's, Inc. may have stumbled upon it.

The photocopying retail chain built a network to offer Internet access to its customers and is using the same infrastructure to support a money-saving corporate intranet.

Kinko's last month started bundling Internet access with the hourly rental of PCs in its 850 retail stores; when you rent computer time, you get Internet access as well.

With the fees paid by customers, the Internet access service is a money-making operation on its own, said Jim Winsayer, manager of research and development at Kinko's.

But through IP tunneling, Kinko's plans to use the same network to build a secure virtual private IP network to connect Kinko's stores with each other and headquarters.

Winsayer said sharing the access links saves Kinko's the expense of setting up a parallel network. He priced frame relay as an alternative, but found a fully-meshed frame network would cost as much as operating the usage-based Internet network 24 hours per day, which is not required.

The network set up

Each store connects to a local Internet point of presence via the 64K bit/sec channels of a dial-up ISDN line. When supporting intranet traffic, a router in the store establishes a secure, tunneled connection to headquarters, enabling users to access credit information, sales reports and lists of company policies and procedures.

If one store wants to contact another unconnected store, headquarters dials-up the remote router via an analog phone call and tells it to set up an Internet tunnel with headquarters.

Quick Kinko's profile

- HQ in Ventura, Calif.
- 850 stores worldwide
- 23,000 employees
- Web address: http://www.kinkos.com

kinko's

Building the network was relatively easy, Winsayer said. The company signed up with GTE Corp. for Internet access.

It then hired Lucent Technologies, Inc. to establish ISDN phone lines for each Kinko's store, instead of trying to deal with the phone companies itself.

"We knew that would be an unpleasant job, and Lucent had done this before," Winsayer said.

Kinko's could use nearly any available ISDN router to link customers to the Internet, but the intranet called for additional requirements.

The company wanted the router to be able to support dynamic IP address assignment — whereby an IP address is assigned to a user each time he logs in — because ISPs charge less for this service than for permanent IP addresses.

The router also had to be able to automatically assign IP addresses to devices on the LAN so they could share the single Internet connection and router IP address. And the router had to be able to protect valuable corporate information, Winsayer said.

Pipeline 130 routers from Ascend Communications, Inc., were chosen over boxes from Adtran, Inc., Cisco Systems, Inc. and Farallon Communications, Inc.

Only Ascend met all of Kinko's criteria, Winsayer said. Lucent provisioned the Pipeline 130s for deployment.

The routers support IP Security (IPSec) protocols. The protocols define encryption, authentication and key management security standards for ensuring the privacy, integrity and authenticity of data over public IP networks.

In addition to IPSec, Kinko's will use Netscape Communication Corp.'s Certificate Server digital certificates to authenticate remote users.

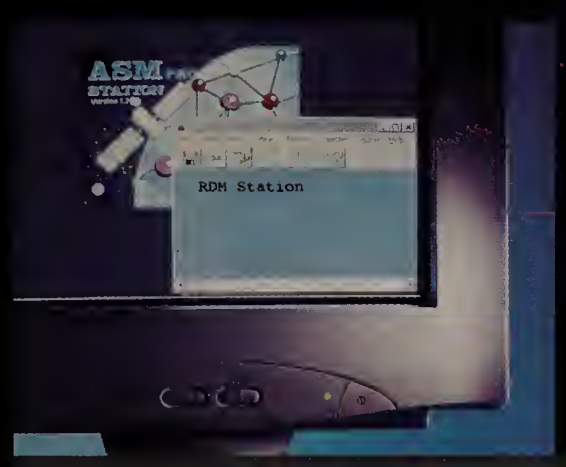
By year-end, the intranet will become fully operational. At that point, Kinko's can phase out paper distribution of corporate policies and procedures and post them on an internal Web page instead, Winsayer said.

Quick ISDN setup times also will allow each store to do credit card checks over the Internet, through Kinko's headquarters and over a dedicated link to a credit card verification service. ■

CORRECTION

In the Oct. 6 issue, the phone number for Plaintree Systems, Inc. on page 26 was listed incorrectly. The correct phone number is (617) 965-5811.

Powerful dual Intel Pentium II processors. And, a suite of Acer management software eases network administration.



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McAfee mates with Network General

Security software firm snatches net management vendor for $1.3 billion.

By Jim Duffy
Santa Clara, Calif.

In an effort to become a one-stop shop for network management and security products, McAfee Associates last week said it would acquire LAN diagnostics vendor Network General Corp., for $1.3 billion in stock.

McAfee's purchase of Network General is one of the biggest deals to date in network and systems management. The price is comparable to the $1.7 billion Computers Associates International, Inc. paid for Legent Corp. and is almost double what IBM paid for Tivoli Systems, Inc.

McAfee's Zach Nelson *says Sniffer's future is being explored.*

The combined company, which will be called Network Associates, Inc., will offer two of the most recognized product lines in the net management and security markets: Network General's Sniffer network analyzers and McAfee's VirusScan antivirus software.

The two companies said their product offerings overlap very little, even though over the past few years both have been acquiring companies to broaden their offerings. McAfee has been particularly aggressive. Last year it made an unsuccessful $1 billion bid for Cheyenne Software, Inc. (*NW*, April 22, 1996, page 10) and traded lawsuits with rival Symantec Corp.

Yet this deal caught some Network General customers off-guard. They had never heard of McAfee and questioned the synergy between an antivirus software company and a packet probe vendor.

"That comes right out of the blue; I'm aghast," said Mitch DeWaters, LAN/WAN development manager for the digital printing and systems center at Eastman Kodak Co., in Rochester, N.Y. "McAfee is more of an application vendor, whereas you're at the protocol and physical layer with Network General. I don't see McAfee understanding how to enhance a product like the Sniffer or NetXray. To my knowledge McAfee has no experience in that arena."

"Why would [McAfee] have an interest in Network General?" asked Robert Maltese, a member of the technical staff at Aerospace Corp., in Los Angeles. "It sounds like a little bit of an odd combination. I guess the question would be: How talented are the folks at McAfee to continue [the Sniffer] product, and are they going to continue the product?" said Maltese.

Asked if McAfee will continue to enhance the Sniffer product line, Zach Nelson, McAfee general manager, said, "We're looking at that right now. What we're planning to do organizationally, as we merge the groups and try and make some of those decisions, is to keep the Sniffer business, in effect, intact."

Areas of particular appeal to McAfee are Network General's customer base and future product directions, particularly in network security and help desk applications. Nelson specifically mentioned Network General's CyberCop intrusion detection product, Service Level Manager and Help-Desk Consultant help desk applications.

To accomplish the one-stop shop goal, Nelson said, "We're taking the integration work out of the core areas of network management and security."

But McAfee will focus on the desktop-to-Windows NT server environment rather than trying to compete with global enterprise managers like Tivoli Systems's TME or Computer Associates International's CA-Unicenter TNG, Nelson said.

That's not to say they won't butt heads over time.

"Depending on the growth of NT, we hope we're right in the sweet spot of where systems management is going," Nelson said.

Analysts said it makes sense for McAfee and Network General to combine — for survival as well as synergy — since the companies are headed in the same market direction.

"Network General has been having a little bit of trouble trying to get away from its Sniffer legacy," said John McConnell, president of McConnell Consulting, Inc., in Boulder, Colo. "Their Total Network Visibility [strategy] is a promising framework, but it doesn't have a lot of tools."

Total Network Visibility is Network General's year-old architectural framework for managing systems, networks, applications and databases (*NW*, Aug. 19, 1996, page 16).

The McAfee/Network General union is another example of the industry undergoing consolidation, said Fred Ziegel, a partner at investment firm Punk, Ziegel & Knoell, in New York. "Broader product lines are going to win out over companies with point products," he said.

Amen, say McAfee and Network General officials. Network Associates will be the world's largest network security and management software company, and the 10th-largest independent software company, according to McAfee and Network General officials. In addition, Network Associates will be the largest third-party software provider for Microsoft/Intel-based personal computers and server computers, they said.

Under the terms of the transaction, McAfee will offer 0.4167 shares for each share of Network General stock. Both boards have approved the transaction, and the companies plan to complete it within 90 days.

William Larson, president, chief executive and chairman of McAfee, will serve as chairman and chief executive officer of Network Associates. Leslie Denend, president and CEO of Network General, will serve as president.

Larson initiated merger talks in early September, a Network General spokeswoman said. Denend has been on the McAfee board for two years. ■

A $1.3 billion combo

McAfee Associates and Network General will merge to form the world's largest network security and management software company. The new company will be called Network Associates, Inc.

PROFILE: MCAFEE ASSOCIATES		PROFILE: NETWORK GENERAL	
Based:	Santa Clara, Calif.	**Based:**	Menlo Park, Calif.
Founded:	1989	**Founded:**	1986
Markets:	Antivirus, security, help desk, network management and PC diagnostics	**Markets:**	Network fault and performance management, security and help desk applications
1997 revenue (ended Dec. 31):	$181 million	**1997 revenue (ended March 31):**	$240.7 million
Management:	William Larson will serve as chairman and CEO of Network Associates	**Management:**	Leslie Denend will serve as president of Network Associates

Fresh start sought for e-mail security spec

By Paul McNamara

The troubled, yet most popular, e-mail security technology — S/MIME — may find its way onto the Internet standards track after all. But it won't be bearing the corporate flag of long-time chief advocate RSA Data Security, Inc.

RSA formally has renounced trademark and change-control rights to the Secure Multi-purpose Internet Mail Extensions (S/MIME) specification. This renunciation removes what had been a sticking point for S/MIME in terms of being granted an Internet Engineering Task Force working group.

The IETF in August had all but tossed out S/MIME and criticized RSA's attempt to establish the security specification as a standard. The standards body also continued to collect license fees and maintain tight technical control.

Although S/MIME is appearing in a growing number of major e-mail and EDI products, the absence of a formal security standard is seen as exacerbating interoperability issues that have dogged early S/MIME implementations.

"With RSA out of the picture," e-mail vendors who are anxious to see an "open" security standard adopted will modify S/MIME and try to rehabilitate it in the eyes of the IETF, according to Paul Hoffman, director of the Internet Mail Consortium (IMC). IMC is facilitating that effort with input from its membership.

RSA welcomes the effort, according to Tim Matthews, a company product manager. Portrayals of RSA as an impediment to the S/MIME standards effort have been inaccurate, Matthews said. He added the trademark renunciation was a formality that had long been planned.

Meanwhile, an IETF working group has been established to push a competing e-mail security technology from Pretty Good Privacy, Inc. called Open-PGP. There is a possibility both Open-PGP and S/MIME could eventually become standards, according to experts.

"Even if we don't get an S/MIME working group [granted by IETF], we still will work on an open S/MIME that could get on a standards track," Hoffman said.

Trademark ownership and standards disputes aside, RSA continues to beat the S/MIME drum. The company will host an event called "S/MIME Live" on Oct. 31 in San Francisco to demonstrate interoperability between S/MIME-enabled products from RSA, Lotus Development Corp., Netscape Communications Corp., Novell, Inc., Worldtalk Corp. and others.

The uncertainty over e-mail security standards has left vendors and their corporate customers in a quandary.

"The debate is making it difficult for us to make informed plans," said Paul Levesque, a systems engineer at Lockheed Martin Corp., in Manassas, Va.

Microsoft Corp., for example, has added support for S/MIME to its Internet Explorer 4.0 Web

See **S/MIME,** *page 95*

Netcom agrees to buyout by competitive local carrier

By David Rohde
San Jose, Calif.

Continuing the march toward consolidation of Internet service providers with telephony carriers, Netcom On-Line Communication Services, Inc. last week announced it is merging with ICG Communications, Inc.

The companies said their merger would be beneficial in helping users obtain high-speed Internet connections, because their service territories overlap.

ICG is a competitive local exchange carrier (LEC) based in Englewood, Colo., with a significant presence in California. It owns 2,900 route-miles of high-capacity fiber with an additional 1,117 route-miles currently under construction.

Another local carrier marries an ISP

ICG and Netcom at a glance:

Company: ICG
Service began: 1991
Headquarters: Englewood, Colo.
Number of employees: 1,850
First-half '97 revenues: $127.9 million
First-half '97 net loss: $144.4 million
Key network assets: 2,900 miles of fiber, 18 telephone central office switches, 15 frame relay switches

Company: Netcom
Service began: 1988
Headquarters: San Jose, Calif.
Number of employees: 800
First-half '97 revenues: $80 million
First-half '97 net loss: $18.4 million
Key network assets: 330 Internet points of presence, 40,000 dial-in Internet access ports

San Jose-based Netcom is the Internet service provider that pioneered mass-market, flat-rate pricing for dial-up Internet access. It offers 9,000 business customers services such as dedicated Internet access, Web site hosting and IP-based application hosting, including Lotus Corp.'s Lotus Notes.

"Netcom has been on the market for some time," said Barbara Ells, an ISP industry analyst at Zona Research, Inc., in Redwood City, Calif. "They've been very aggressive but have not been able to reach the point of profitability." The merger with ICG should enable Netcom to slash its costs by reducing its need to lease fiber capacity from other carriers, Ells said.

The ICG-Netcom deal is the latest in a recent trend of mergers between LECs and ISPs. The most prominent was last year's purchase of UUNET Technologies by MFS Communications Company, Inc., a combination that has since been swallowed up by telecom mega-purchaser WorldCom, Inc. That merger was followed this year by GTE Corp.'s purchase of ISP BBN Corp., as well as a deal by Intermedia Communications, Inc., a Florida-based local and long-distance carrier, to buy national ISP Digex, Inc.

Netcom stockholders will receive about .86 share of ICG common stock for each Netcom share, totalling $283.5 million at the current market value.

Like most competitive LECs, ICG has been losing money. But the company has Wall Street's blessing because of the perceived need to build facilities-based local networks to compete with regional Bell operating companies. The merger is expected to close in the first quarter of 1998, pending shareholder and regulatory approvals. ■

Lost on the Web: Search tools ease query pain

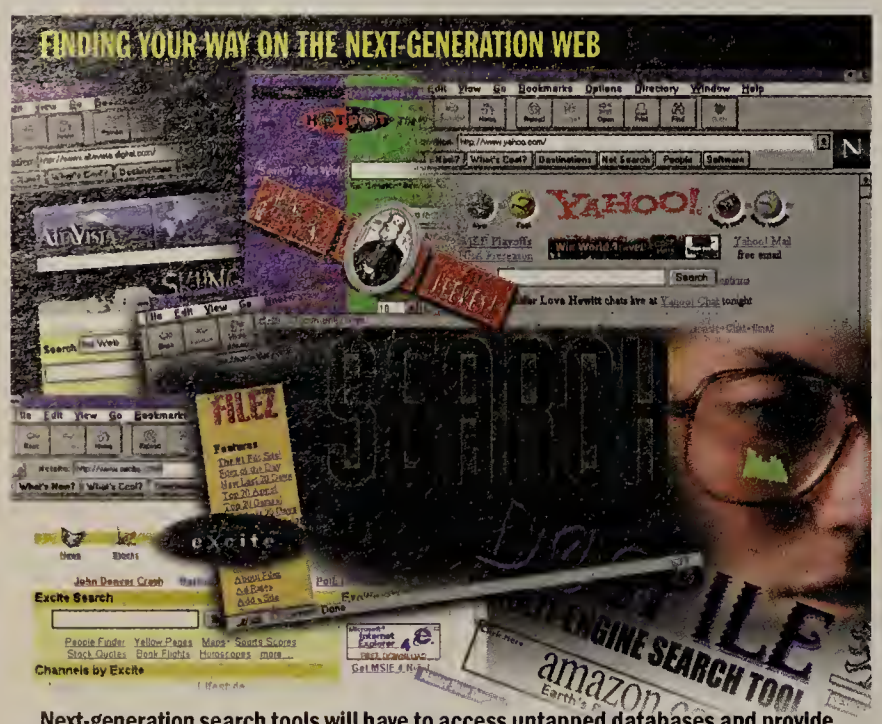
Search start-ups provide more precise information than traditional search engines.

By Sandra Gittlen

Call it the end of the Internet search engine as we know it.

No longer are users content to scroll through pages and pages of possibly relevant information, only to find nothing of use. Web surfers want quick answers to questions and keyword searches, and this means new search technologies.

A new crop of search tools from a bunch of start-ups are answering the demand.



Next-generation search tools will have to access untapped databases and provide more relevant hits to be more useful than traditional search engines.

Currently, the search tool landscape comprises approximately 200 search companies.

These companies use a variety of methods to gather information, including the use of "spiders," which are automated tools that gather information from the Internet, use of editors to collect and categorize data, and a combination of both.

Search tool developers said the combination of automated data collection and human categorizing will be the key to keeping search databases up-to-date and information relevant to individual searches.

"Information has to be categorized and massaged a bit," said Michael Sullivan-Trainor, director of the Internet program at International Data Corp., in Framingham, Mass.

This is where the human element comes in. Information from the Web has to be sorted and tagged with data denoting its relevancy. Yahoo, Inc. has made its name in this arena, using editors to cull through and label relevant hits so a user receives a detailed explanation of a return, not just the first line from the document.

"Creating a search tool is a discovery mission and whoever can supply the best map by collecting and categorizing Web sites is going to last," Sullivan-Trainor said.

Start-ups are beginning to follow this path. It is important for companies entering the search field to do two things: search new data sources and find useful data that people want to search, said Michael Robertson, CEO of start-up search company FileZ Corp.

FileZ has done just that. The San Diego-based company has developed a searchable database of File Transfer Protocol software — downloadable shareware, freeware and retail.

Also, the company just unveiled WebsiteZ, a searchable database of domain names, both active and inactive, and their owners. Robertson said it is this type of utilization of untapped resources that in the future will be needed for start-ups to survive.

Robertson pointed to start-up Ask Jeeves, Inc., based in Berkeley, Calif., as another example of a company using unique searching methodology. Ask Jeeves allows users to input a natural-language query, such as, "Do you know of a good florist in Berkeley?" and they receive a list of sites where the answer can be found.

"We're all trying to make it super-easy for users to find what they want," said Dan Miller, president of Ask Jeeves. "Eight times out of 10, people just want a piece of info, and we give them that." He added that the AltaVista search engine still is an excellent tool for finding sites and all mentions of a single query.

Another type of emerging search tool, the metasearch engine, such as www.dogpile.com, allows users to pare down information and refine searches on the fly. It also lets users search all the popular databases simulta-

See **Search,** *page 96*

Microsoft woos small business

Simplified NT software suite joins a crowded field.

By Christine Burns

San Jose, Calif.

Microsoft Corp. this week is hoping to make a big splash in an already crowded pool of integrated server suites that target the small-business market.

The BackOffice Small Business Server (SBS) comprises NT Server 4.0 and tightly woven e-mail, fax, Web, remote-access and database services, which all run on a single 166-MHz Pentium box. The company plans to unveil SBS on Wednesday at a small-business summit here.

Microsoft has streamlined installation of the services into a single five-step wizard. An HTML, task-based management utility allows internal IT professionals or remote value-added resellers (VAR) to control the services via any Web browser.

Microsoft has positioned SBS for use in stand-alone configurations only. The company will not push SBS for use in corporate branch offices, as it offers little in the way of integration software with existing networks.

For example, the single-domain model of SBS does not support NT domain trust relationships, which define user access rights across different segments of an NT network. Therefore, user accounts established under SBS would not be able to access any resource designated to any other corporate NT domain.

The small-business market Microsoft is going after with this new product is not insignificant. This segment last year spent $20 billion on both hardware and software.

International Data Corp., a research firm based in Framingham, Mass., estimates that almost 75% of small businesses currently have one or more PCs, but only 30% have those machines configured on a network.

Industry observers note that while this is indeed a huge market opportunity, the Redmond, Wash.-based software giant joins several other vendors that already have shipped products which also target environments of 50 users or less. Lotus Development Corp., Netscape Communications Corp. and Novell, Inc. each have products that address this segment of the market (see graphic).

Despite the jump the competition has on SBS, Microsoft is uniquely positioned to land most accounts that already have Windows desktops installed, said Betsy Johnson, product manager for SBS. "There is an undeniable comfort for these customers to have only one vendor. If something goes wrong, they know who to call," Johnson said.

Computer Connection Center, Inc., a VAR based in Akron, Ohio, has installed beta SBS code to establish a 10-user network at a small machine manufacturing company.

While assimilation to existing Windows 95 desktops was helpful, the easy installation and integration between all of the services was more crucial to the company's choice of SBS over one of the alternatives, said Bob Angerstien, vice president of Computer Connection Center.

"Everything is right there for them. They don't need to know how to run a Web server, separate from file and print, or the e-mail package. It's one integrated system that is managed that way," Angerstien said.

Rob Enderle, an analyst with Giga Information Group, Inc., in Santa Clara, Calif., pointed out that Microsoft's concerted efforts to cultivate the VAR channel to sell and support SBS, an initiative which he valued at upwards of $500 million, will prove advantageous for Microsoft.

"They've stacked the decks with people who know how to install, use and manage this system. They can hit the ground running in this market," Enderle said.

SBS is designed to support two to 25 users. It will ship later this month and will cost $1,499 for a five-user license. ■

Small-business server market getting crowded

Product	Target number of users	Directory	E-mail	Web services	Price
Microsoft BackOffice Small Business Server	25 or less	Single NT domain	Exchange	IIS 3.0	$1,499
Novell IntranetWare for Small Business	25 or less	NDS single site	GroupWise 5.0	Novell Web Server 2.5	$895
Netscape SuiteSpot Standard Edition	Minimum of 50	Directory Server 1.0	Messaging Server 3.0	Enterprise Server 3.0	$65/user
Lotus Intranet Starter Pack	Companies with no dedicated IT staff	Domino site directory	Internet Mail	Domino	$1,695

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Developers say IE 4.0 is for Java veterans only

By Chris Nerney

In its recent lawsuit, Sun Microsystems, Inc. claims Microsoft Corp. is destroying the promise of Java compatibility by refusing to support what it says are three critical technologies.

Of course, Microsoft claims to be as compatible as anyone.

Developers, caught in the cross-fire, see merit to both arguments.

Specifically, the suit claims Microsoft's new browser, Internet Explorer (IE) 4.0, lacks two key components of Java Development Kit (JDK) 1.1 — Remote Method Invocation (RMI) and Java Native Interface (JNI) — and also includes altered Java class libraries.

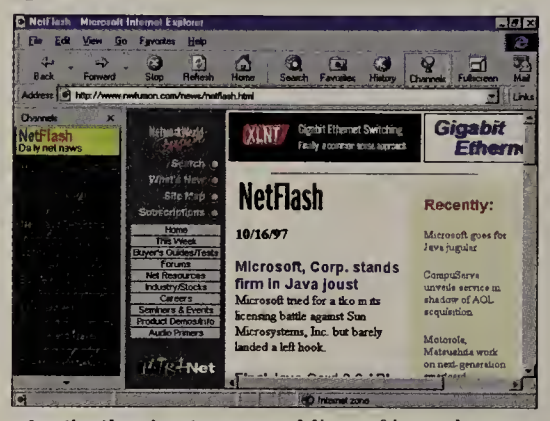
Because Microsoft does not support JNI or RMI, applications created with JDK 1.1 may not run on IE 4.0.

RMI enables developers to write software that can communicate with Java applications on other Java Virtual Machines. JNI is the interface through which a Java application developer can access native code on an operating system.

But several Java developers interviewed by *Network World* said the omissions and alterations in IE 4.0 could be "worked around" by experienced programmers. "I don't care about RMI and JNI," said Vidya Vaidyanathan, president of Paralogic Corp., in Fremont, Calif. "RMI is not very reliable, and it's just not scalable. Even if it was there, we wouldn't use it."

"For most people, the lack of JNI is not a problem if you're trying to create a pure Java solution," said John Zukowski of the MageLang Institute, a research group dedicated to promoting Java.

But less experienced programmers may run into snags with IE 4.0, Zukowski said. "Somebody who knows what they're doing can create programs that will work everywhere. Someone not as familiar with Java may not realize they're using a Microsoft-specific Java enhancement that isn't portable," he said.



Application developers *say Microsoft's new browser, Internet Explorer 4.0, is a fast Java client, though some prefer its predecessor, IE 3.0.*

A fast, shaky ride

Meanwhile, developers gave IE 4.0 mixed reviews as a Java client. Though several of them praised its speed in running Java applications, others re-ported numerous bugs and stability issues.

Kevin Bohacz, founder of KJB Software Development, Inc. in Dallas, said he has had problems running pre-existing Java applications on IE 4.0. Worse, his company released a new Java electronic commerce product shorly before Microsoft launched IE 4.0, he said. The software now needs new code to work on Netscape and the new Microsoft browser.

Bohacz said he doesn't need that hassle.

"I'm definitely not going to support their proprietary goodies," he said. "I'm going to write 100% pure stuff because that's what my customers need and want."

Still, some developers agreed with Microsoft's own sterling assessment of IE 4.0. "It's great," said New York-based developer Alex Chaffee.

"Internet Explorer always has been a more stable implementation of Java than Netscape or even Sun's version on the Win32 OS," he said.

Chaffee said he wrote a class-file script to determine how much Microsoft had altered Java class libraries. "The changes Microsoft made were not very major," he said. "They were mostly additions, and only a single deletion in a moderately obscure class." ■

Sun, Microsoft finally agree on something

Companies give public a look at source of Java dispute by posting licensing agreement. .

By Chris Nerney and Sandra Gittlen

Taking their cases to the court of public opinion, both Sun Microsystems, Inc. and Microsoft Corp. last Wednesday posted the Java licensing agreements, which are at the heart of the legal dispute between the two industry giants.

Sun also posted an amendment to the lawsuit it brought against Microsoft nearly two weeks ago. Filed last Tuesday in a California district court, the new document shows that Sun is seeking $35 million in damages, plus attorney fees, from Microsoft.

Microsoft's Charles Fitzgerald *calls JNI and RNI "supplemental Java classes."*

Sun's JavaSoft division filed the lawsuit after claiming Microsoft's commercial version of its Internet Explorer (IE) 4.0 browser — released Sept. 30 — failed Sun's Java compatibility tests. This failure violates the Java technology distribution and licensing agreements signed by Microsoft in March 1996, according to Sun. The suit alleges trademark infringement, false advertising, breach of contract, unfair competition, interference with prospective economic advantage and inducing breach of contract.

The two companies last week agreed to make the actual licensing contracts publicly available via the Internet.

But consent ended there. Though Sun executives refrained from debating specifics of the licensing agreements, Microsoft officials went into aggressive spin mode, soliciting interviews with journalists and analysts and accusing Sun of "selectively excerpting" portions of the contracts.

In its lawsuit, Sun claims Microsoft was in contractual violation because IE 4.0 and Software Development Kit 2.0 excluded two key Java components — Java Native Interface (JNI) and Remote Method Invocation (RMI).

Sun also alleged that Microsoft altered Java class libraries in a way that would trick developers into thinking they were using 100% Pure Java, when they actually would be using Java that can only run on Windows.

But Charles Fitzgerald, Microsoft's group program manager for Internet and client collaboration, said JNI and RMI were "supplemental Java classes." Section 2.7A of the technology agreement gives the licensee the option of excluding such classes, he argued.

A Sun spokesman declined to comment, referring questioners to the company's amended complaint.

Meanwhile, one high-tech legal expert who has reviewed parts of the technology agreement predicted the lawsuit will never make it to trial.

"This is a case that's going to settle," said Curtis Karnow, a partner at the law firm of Sonnenschein Nath & Rosenthal.

Karnow said he would have to study the agreement in detail to assess each company's argument, but said it is "clear that the overall intent of the contract is that Microsoft is supposed to make things compatible under Sun's definition of compatibility." ■

Java gets smarter

Sun Microsystems, Inc.'s JavaSoft division last week posted the final version of its Java Card API 2.0 specification, which will enable developers to build more Java applications that can run on smart cards.

Sun officials said the Java Card 2.0 specification adds detailed information to the API for building Java Virtual Machines in very small memory environments. Smart cards look like credit cards but include a computer chip that can store information such as bank and medical records.

Java Card 2.0 will allow card manufacturers to produce smart cards that can interoperate with each other, as well as with existing cards and card-scanning transaction terminals, said Patrice Peyret, director of JavaSoft's smart-card group.

Java Card 2.0 API can be downloaded at http://java.sun.com/products/javacard.

— Chris Nerney

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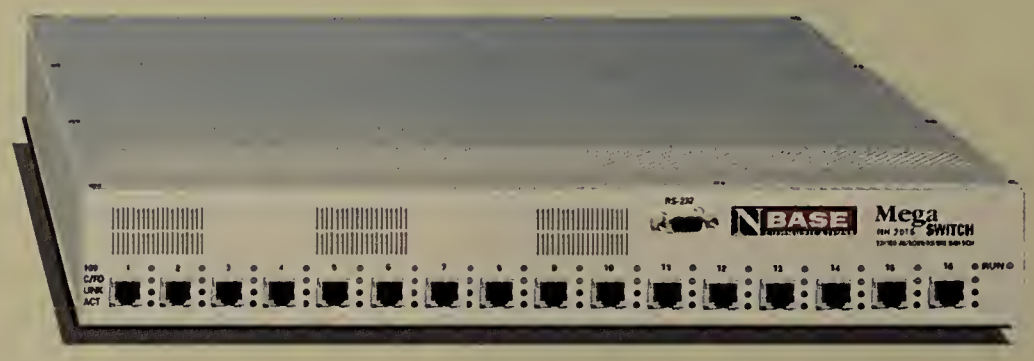

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Briefs

■ **Xylan Corp.** *last week announced it is adding* **circuit emulation** *services to its line of switches. A new set of modules for Xylan's* **OmniSwitch and PizzaSwitch** *devices allows customers to transport data, voice, video and other circuit*

Xylan's *OmniSwitch and PizzaSwitch will be getting circuit emulation services.*

traffic across a single ATM circuit. The circuit emulation services can be used in carrier networks as a digital cross connect or in private networks to allow voice traffic to ride on the same ATM network as data.

For the OmniSwitch, module prices range from $12,000 to $17,000. For the PizzaSwitch, from $6,950 to $9,950.

© Xylan: (818) 880-3500

■ **Attachmate Corp.** *this week will roll out a product that improves connectivity between Unix and Windows NT machines. The firm's* **PathWay Server NFS for Windows NT** *provides any Unix-based Network File System client with access to data and file resources residing on any NT machine. It is available now for $395.*

© Attachmate: (425) 644-4010

■ **Essential Communications** *and* **SEEQ Technology, Inc.** *last week announced they have partnered to develop a one-chip solution for their respective Gigabit Ethernet network interface card and controller product lines. The new PCI Gigabit Ethernet single controller provides all the capabilities previously delivered by three chips.*

© Essential: (800) 278-7897; SEEQ: (510) 226-7400

Microsoft's Hydra software rears its head

By Christine Burns and John Cox
Redmond, Wash.

Microsoft Corp. proved its Hydra multiuser NT server is on track when the company showcased an alpha version of the software at the recent NetWorld+Interop 97 show in Atlanta.

The demonstration gave interested users a good, hard look at how NT Server 4.0 in the future will be able to serve up full 32-bit applications to end users sitting at distributed thin clients, legacy 16-bit Windows desktops and Macintosh machines.

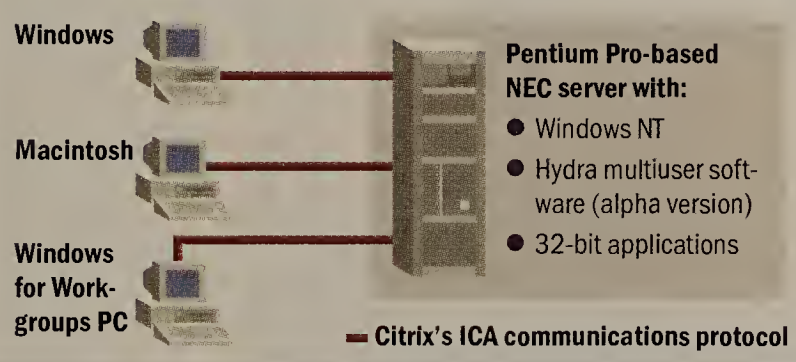
But the technology demonstration raised serious questions about whether Windows NT and Hydra will be able to deliver good performance for graphics-intensive multimedia applications. Because the code employed an existing protocol for sending the screen shots from the server out to the client, it did not give users a sense of how Microsoft's new T.Share protocol will perform in this scenario.

Hydra lets thin clients, such as terminals and network computers (NC), as well as full-blown PCs and Macintoshes, simultaneously access applications that run on an NT server. Hydra is widely seen as Microsoft's effort to forestall customers from embracing Java-oriented NCs, which favor server-based Java applets over client applications based on Microsoft operating systems.

Microsoft's multiuser server, based on technology licensed from Citrix Systems, Inc., of Fort Lauderdale, Fla., is on schedule to enter beta tests by year-end and will ship by mid-1998, said Solveig Whittle, the NT product manager who ran Microsoft's Hydra demo. Hydra will be sold as an optional package for NT 4.0 and 5.0; Microsoft will charge a server license and a per-client access fee.

HYDRA COMES OUT OF HIDING

A NetWorld+Interop 97 demo showed three different clients accessing applications from a server running Microsoft's Hydra multiuser NT software. Hydra is scheduled for beta release by year-end.



Packet Engines premieres powerful routing switch

Gigabit Ethernet backbone device delivers wire-speed routing and switching.

By Jodi Daniels
Spokane, Wash.

Gigabit Ethernet start-up Packet Engines, Inc. has added a new routing switch to its arsenal.

Called the PE-4884 — named after the Union Pacific's famous "Big Boy" train — the backbone switch provides wire-speed switching and routing at 75 million packet/sec.

Unlike some of its competitors that support only IP routing, Packet Engines is providing wire-speed routing for IPv4, IPv6 and IPX traffic. The switch also supports software-based routing for as many as eight additional legacy protocols, such as DECnet and AppleTalk.

The 52G bit/sec 14-slot chassis supports as many as 25 Gigabit Ethernet ports, 240 Fast Ethernet ports or a combination of the two. The switch supports 64,000 media access control or IP addresses per port, or more than 1.5 million addresses per switch.

This "Big Boy" was born for the backbone. Customers are expected to use the switch to aggregate traffic from smaller Gigabit and Fast Ethernet wiring closet devices.

In addition to Fast and Gigabit Ethernet, the PE-4884 switch supports FDDI, Synchronous Optical Network (SONET) and ATM interfaces.

Other key features include the ability to route based on Layer 4 attributes and quality of service (QoS) capabilities.

The PE-4884 delivers bandwidth management features, including hardware-based prioritization with eight priorities per port.

Pricing for the Packet Engines chassis has not been set, but Gigabit Ethernet ports will be priced at $2,995. The PE-4884 will ship in the first quarter of 1998.

© Packet Engines: (509) 777-7000

Stacking up the gigabit routing switch market

Vendor	Product	Backplane capacity	Max. number of Gigabit Ethernet ports	IPX wire-speed routing	Modular/ chassis-based
Packet Engines	PE-4884	52G bit/sec	25	Yes	Yes
Bay	Accelar 1200	15G bit/sec	12	No	Yes
Extreme	Summit I	18G bit/sec	8	No	No
Foundry	TurboIron Switching Router	4G bit/sec	6	Yes	No
Prominet	Cajun P550	42G bit/sec	24	Yes	Yes

Show attendees saw a trio of desktop clients — a Windows terminal, a PC running Windows for Workgroups and a Macintosh — accessing and running applications on the Hydra server (see graphic, above). The demonstration also showed that relatively few clients could be supported by each server CPU. And graphics-intensive applications ran much slower on the server than they would on a PC.

For the demo, Microsoft ran Hydra on an NEC America, Inc. computer outfitted with one 166-MHz Pentium Pro processor and 140M bytes of RAM. At present, Microsoft is following Citrix's server sizing recommendations: 15 to 20 users per Pentium Pro, depending on the specific applications. Hydra so far is untested

See **Hydra,** *page 21*

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IT managers everywhere: sharpen your scissors.

Novell hunts for big clustering role with Orion

Company will release beta version of add-on software that provides automatic failover in the first half of 1998.

By Christine Burns
Atlanta

In an effort to boost IntranetWare's pallid reputation as a mission-critical application server, Novell, Inc. is pushing ahead to bring multinode clustering to its flagship product.

By late next year, when Novell ships the next version of its operating system, the company also will have completed Orion, an add-on product that provides automatic failover for as many as 16 clustered IntranetWare servers.

Novell first demonstrated its preliminary work on clustering in March at the BrainShare conference, when it showed off its Wolf Mountain technology. Wolf Mountain's advanced system provided load-balancing and failover capabilities across multiple operating systems running on 48 machines.

However, in May two of the primary Wolf Mountain engineers left Novell to form their own company focused on NT-based clustering. This raised much industry skepticism over whether Novell could deliver an IntranetWare-based clustering product in time to rival Microsoft Corp.'s WolfPack two-node clustering for Windows NT Server.

Microsoft last month delivered its two-node clustering technology with NT 4.0 Enterprise Edition, but the company is not expected to provide 16-node clustering for NT until next year.

While Orion will be released a year after WolfPack, its capabilities will leapfrog those in the Microsoft technology, said Michael Bryant, director of marketing for Novell clustering.

Orion will enable 16 standard Intel Corp.-based boxes to work together as a single system for easier server and application management and better end-user access to networked services, Bryant said.

Orion offers load-balancing across servers, server failover among any of 16 nodes, application failover and an automatic 32-bit client reconnection feature. The project will enter beta tests in the first half of next year and will ship before the end of 1998.

The Hillsborough County, Fla., information systems department is looking forward to using clusters to support everything from its IntranetWare-based data backup services to its IP gateways and GroupWise collaboration applications.

"They are talking about failover rates of less than three seconds. That's more impressive than what I have seen Microsoft do with only two machines using WolfPack," said Bill Kannberg, manager of network services with Hillsborough County.

All of the clustered Orion servers, applications running on them and end-user access will be managed through Novell Directory Services, Bryant said.

Novell is working with several partners, including Compaq and Intel, on a hardware interconnect that will provide the high-speed link between clustered servers.

✆ Novell: (800) 453-1267

Novell moves toward IntranetWare clustering

June 1996
Microsoft demonstrates two-node NT clustering.

March 1997
Novell shows cross-platform Wolf Mountain multinode clustering technology.

September 1997
Microsoft ships two-node clustering with NT 4.0 Enterprise Edition.

1996 | 1997 | 1998

October 1997
Novell details plans for Orion, a 16-node clustering add-on for IntranetWare.

First half of 1998
Orion beta expected.

Second half of 1998
Orion expected to ship as add-on product to Moab.

Hydra

Continued from page 17

on multiprocessor machines.

Whether or not customers will need a dedicated Hydra server depends on the number of users and the applications, Whittle said. "Hydra is optimized for displaying multiuser screens," she said. "It focuses on front-end processes, making sure the screens are executed as quickly as possible for all the users connected." If Hydra needs more processing power to fulfill this primary task, other back-end services will be put on hold.

One Intel Corp. senior IS official mentioned several potential issues that administrators and users will have to take into account. "This [demonstration] really shows that you have to limit the use of this stuff to task-based users," he said. "High-graphics applications will suck up memory and CPU power. Microsoft has to come up with a means for allowing an administrator to limit both the CPU cycles and the amount of memory any one client can have at a given time."

Via the NT Performance Monitor, Interop attendees could see how each client attached to the Hydra server affected its performance. The Windows terminal, for example, accessed the server to tap into a 32-bit customer service application. The application ran almost as fast as if it were running on the desktop itself. The NT Performance Monitor showed little strain on the server CPU.

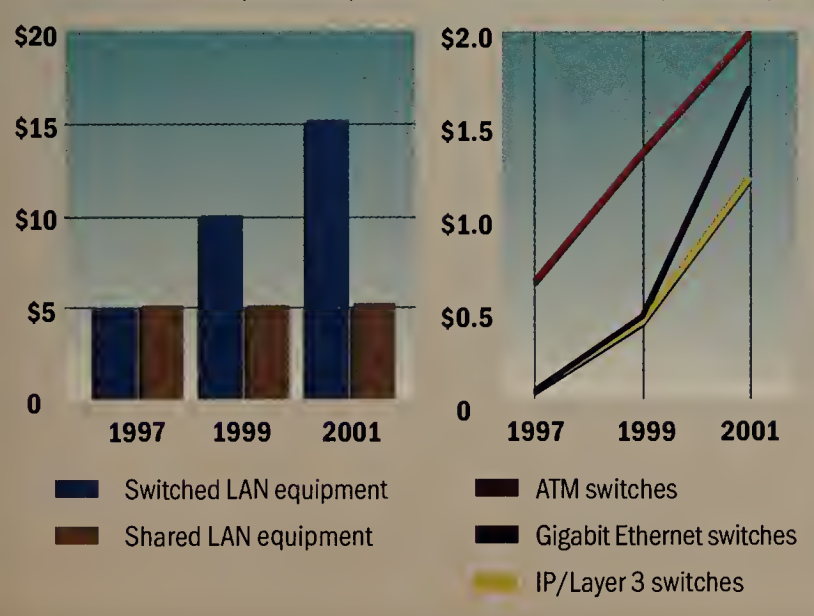
The monitor showed a much higher CPU load for the Windows for Workgroups client. The load surged even more when the demonstrator used Microsoft Internet Explorer to scroll a Web page. Finally, when the Macintosh accessed a PowerPoint presentation on Hydra, performance slowed still more and CPU utilization spiked upward sharply.

One critical missing piece was Microsoft's T.Share communications protocol, which is still under development.

T.Share, which is based on the T.120 standard for data conferencing, is currently used in Microsoft's NetShare product. For the Interop demonstration, the clients used the Citrix ICA protocol instead. ■

NO CONTEST: SWITCHED OVER SHARED

Sales of shared LAN products will stagnate, while sales of switched LAN gear will explode, according to Datamonitor, a global technology analysis firm in New York.



Vendors smartening up servers

I2O technology to offload work from server CPUs.

By Marc Songini
Santa Clara, Calif.

A dozen server vendors have announced they will embrace an Intel Corp. chip technology that will enable their systems to support more clients and manage peripherals more efficiently.

Intel's i960 chip supports a technology called Intelligent Input/Output (I2O), which a multivendor task force began cobbling together last year. The i960 chip is designed to offload I/O functions from a server's CPU to an I/O subsystem, which can free up CPU cycles to handle application processing.

The concept behind the technology is simple. "What happens is there is an offloading of some of the more mundane tasks from the CPU, and they are now handled by the I/O subsystem," said Gak-Wee Low, product manager of Hewlett-Packard Co.'s Network Server Division, which intends to deliver an I2O-compliant adapter card for disk array control. "[I2O allows] more headroom for database work and number crunching," Low said.

Vendors said they either will install the i960 on their server motherboards or through adapter cards. Among the other companies rallying around the i960 and I2O are Compaq Computer Corp., Dell Computer Corp., Gateway 2000, Inc. and IBM.

I2O: The new way to go

Intelligent Input/Output (I2O) is Intel's new technology that off-loads I/O activity from the server's main microprocessor by increasing overall server performance. Vendors using I2O in their server systems include:

- Compaq
- Dell
- HP
- IBM
- NEC
- NCR
- Micron
- Supermicro

IBM plans to use Intel's i960 chips for its Netfinity server line to run transaction-heavy electronic commerce applications. Those servers will be available at the end of the month.

In addition to support from hardware vendors, Microsoft Corp. and Novell, Inc. will roll out software that supports the I2O technology over the next few months.

Analysts said the sky's the limit for I2O. "Presently the technology will be used primarily for storage functions, but other implementations will be coming in the future, such as peer-to-peer communications, clustering and hot plug PCI," said James Gruener, senior analyst at consultancy Aberdeen Group, Inc., in Boston. ■

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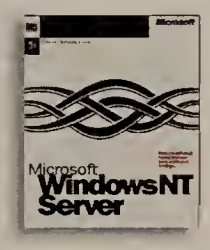

Microsoft Windows NT® Server

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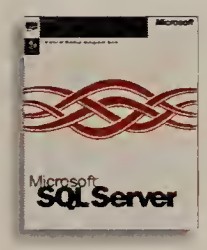

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WIRED WINDOWS

Just what is Sun trying to prove?

Unless you've been orbiting on Mir for the past couple of weeks, you should be aware that Sun Microsystems has sued Microsoft over the implementation of Java in Internet Explorer 4.0. Specifically, Sun claims Microsoft made unauthorized changes in Java support files and libraries and failed the Java Compatibility Test required of all vendors that have licensed Java.

There's been quite of lot of ink and paper devoted to the discussion of this lawsuit. As to the merits of the suit, few of us are in a position to judge. The license Microsoft signed with Sun remains secret, as do the results of the compatibility test. Sun says Microsoft's browser failed, while Microsoft says the software didn't. It will be up to a judge to decide who is right.

I hope that makes you cringe as much as it does me. While a judge is best positioned to interpret the legalisms of the contract or the licensing agreement, I don't know of any judge competent to interpret the methodology and results of software testing. Let's just hope it doesn't come to that.

Pundits have predicted the end of Java development due to this lawsuit, claiming that developers will be afraid to move forward until the result is known.

Nonsense. We've known for quite some time that Microsoft would not implement 100% Pure Java and has been attempting to lure developers to a Windows-based Java implementation using the lure of better performance. Vendors already have chosen whether or not to stay "pure," and this lawsuit won't change that.

Microsoft has tried to obscure the issue by spreading lots of fog — talking about Netscape and Java, discussing results of its own testing and even attempting to fault Sun for not turning Java over to a standards body. But none of these things is part of the suit, so feel free to ignore them.

Dave Kearns

Meanwhile, lots of people are jumping in and dumping on Microsoft simply because they feel that anything that slows Microsoft's path to computer hegemony is good. Again, ignore this. It isn't part of the lawsuit.

The issue in the lawsuit is simple: Did Microsoft breach the license agreement it signed with Sun? The only odd thing about the suit is the remedy Sun is seeking: not money, but a court order to force compliance. This is the part I don't understand.

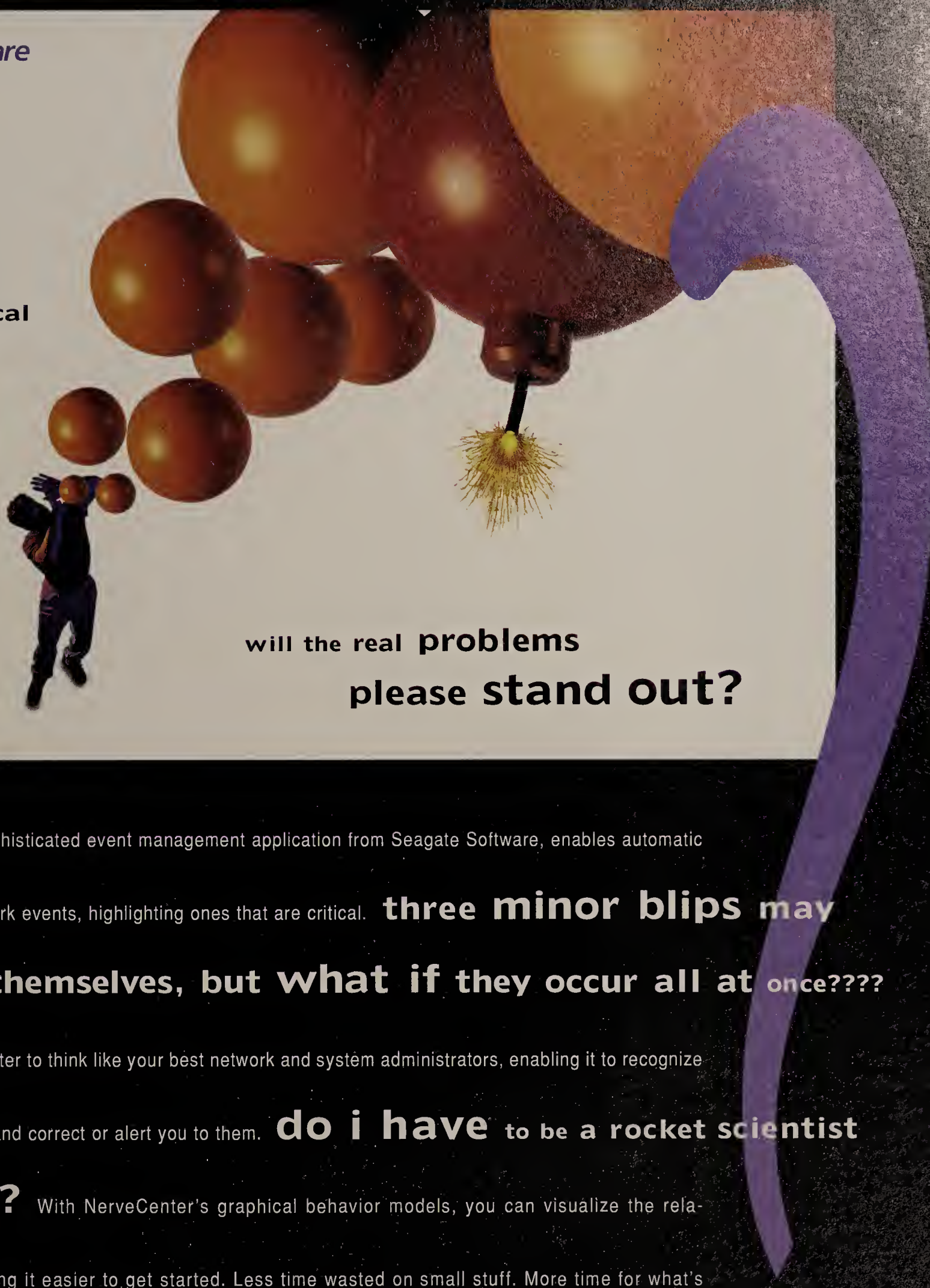
Normally, in a license agreement dispute, Sun would simply revoke the Java logo from Microsoft for noncompliance. Microsoft would then be forced to sue to get its license back. It makes one pause and wonder exactly why Sun is bringing this suit.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Latest Development

As my column went to press, Sun and Microsoft agreed to make public the contracts and license agreements at the heart of the lawsuit. Sun also filed an amended suit specifying damages in the amount of $35 million. The amended suit, contracts and license agreements are available for your perusal at www.sun.com/announcement/legal.html.

Seagate Software



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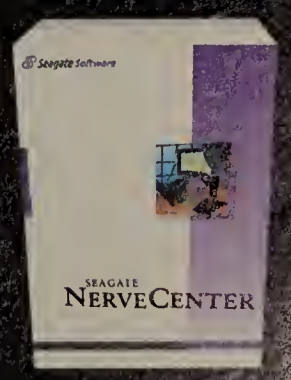

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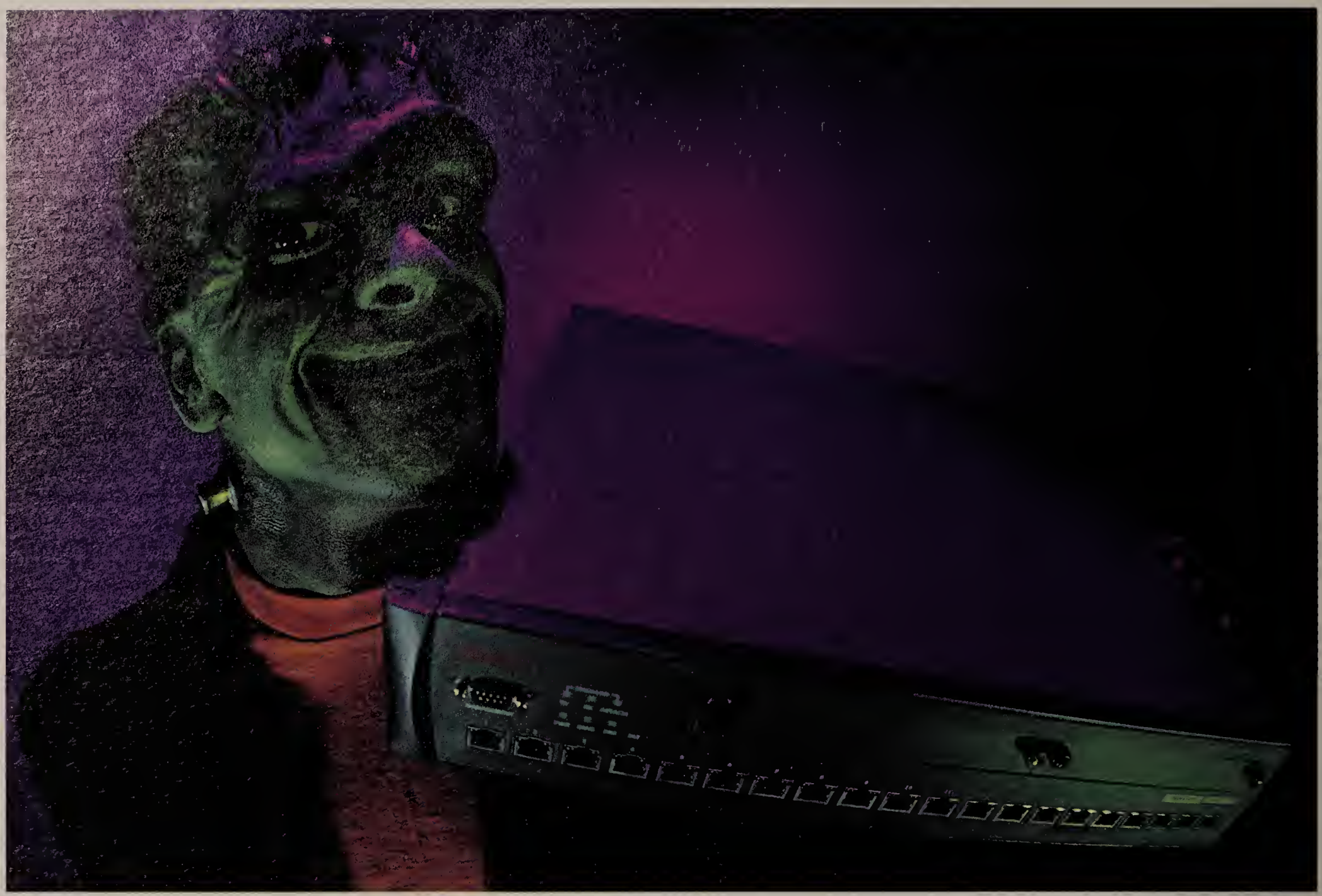

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Form: 9702

1 What is the principal business activity at your location? (check one only)

01. ☐ Manufacturing (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consulting (Independent)*
16. ☐ Carriers/Interconnects
17. ☐ Internet Service Provider (ISP)
18. ☐ Manufacturing (Computer/Communications/OEM)
19. ☐ Resellers of Computer/Network Products (VARs, VADs)
20. ☐ Systems/Network Integrators*
21. ☐ Distributors (Computer/Communications)*
22. ☐ Other *(please specify)* _____

Please complete form based on largest client.

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

1. ☐ Network Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, CIO, Systems Management
5. ☐ Internet/Intranet Management/Webmaster
6. ☐ Engineering Management
7. ☐ Corporate Management (CEO, Pres., VP, Dir., Mgr., Financial Management)
8. ☐ Consultant (Independent)
9. ☐ Other *(please specify)* _____

3 What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please **print** the appropriate **number code** in the box next to each product category. Please complete ALL categories A-M.)

1. $50 Million or more
2. $25 Million to $49.9 Million
3. $10 to $24.9 Million
4. $1 to $9.9 Million
5. $100,000 to $999,999
6. $50,000 to $99,999
7. Under $50,000
8. None of the above

A ☐ Large Systems *(Mainframes/Minis)*
B ☐ Desktops *(Micros/Laptops/Workstations)*
C ☐ Servers
D ☐ LANs
E ☐ WAN Equipment
F ☐ Carrier Services
G ☐ Internetworking
H ☐ Internet
I ☐ Intranet
J ☐ Remote Access
K ☐ Peripherals
L ☐ Software
M ☐ Service/Support

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+ 2. ☐ 50 - 99 3. ☐ 20 - 49 4. ☐ 10 - 19 5. ☐ 2 - 9 6. ☐ 1 7. ☐ None

5 What is the total number of Servers/Clients/LANs installed/planned at your location/in your entire organization? (Check one box in each column)

	SERVERS		CLIENTS		LANS	
	At Location (A)	Entire Org. (B)	At Location (C)	Entire Org. (D)	At Location (E)	Entire Org. (F)
1.	50,000+		50,000+		50,000+	
2.	10,000 to 49,999		10,000 to 49,999		10,000 to 49,999	
3.	1,000 to 9,999		1,000 to 9,999		1,000 to 9,999	
4.	100 to 999		100 to 999		100 to 999	
5.	50 to 99		50 to 99		50 to 99	
6.	10 to 49		10 to 49		10 to 49	
7.	1 to 9		1 to 9		1 to 9	
8.	none		none		none	

6 What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. Involvement (check ALL that apply)
1. ☐ Create Network Strategy
2. ☐ Recommend/Specify
3. ☐ Approve
4. ☐ Evaluate
5. ☐ Determine the need
6. ☐ None

7 What is the estimated number of employees at your location/in entire organization? (check one in each section)

A. At your location:
1. ☐ Over 20,000
2. ☐ 10,000 - 19,999
3. ☐ 5,000 - 9,999
4. ☐ 2,500 - 4,999
5. ☐ 1,000 - 2,499
6. ☐ 500 - 999
7. ☐ 499 or less

B. Entire organization:
1. ☐ Over 20,000
2. ☐ 10,000 - 19,999
3. ☐ 5,000 - 9,999
4. ☐ 2,500 - 4,999
5. ☐ 1,000 - 2,499
6. ☐ 500 - 999
7. ☐ 499 or less

8 Please indicate the products/services that you are currently involved in purchasing or plan to purchase: (Check ALL that apply)

	A. Currently involved in purchasing	B. Plan to purchase
INTERNET/INTRANET		
01.	☐	☐ Internet Services
02.	☐	☐ Firewalls/Security/Encryption
03.	☐	☐ Internet Web Servers
04.	☐	☐ Intranet Web Servers
05.	☐	☐ TCP/IP Software
06.	☐	☐ Management/Monitoring Software
07.	☐	☐ Push Technology
08.	☐	☐ Web Browsers
09.	☐	☐ Intranet Applications/Groupware
10.	☐	☐ Search/Retrieval Products (web crawler)
11.	☐	☐ Internet Development Tools (JAVA, ActiveX, etc.)
12.	☐	☐ Electronic Commerce Tools
13.	☐	☐ Internet Telephony
LOCAL-AREA NETWORKS		
14.	☐	☐ Local-Area Networks
15	☐	☐ Network Operating System Software
16.	☐	☐ Servers
17.	☐	☐ Print Servers
18.	☐	☐ ATM Switches
19.	☐	☐ Token-Ring Switches
20.	☐	☐ Ethernet Switches
21.	☐	☐ Fast Ethernet
22.	☐	☐ Gigabit Ethernet
23.	☐	☐ IP Switches
24.	☐	☐ LAN Storage/Backup
25.	☐	☐ Optical LAN Storage/Backup
26.	☐	☐ Disk LAN Storage/Backup
27.	☐	☐ Tape LAN Storage/Backup
28.	☐	☐ RAID LAN Storage/Backup
29.	☐	☐ Network Test/Diagnostic Tools
30.	☐	☐ Cables, Connectors, Baluns
31.	☐	☐ UPS
32.	☐	☐ Network Interface Cards
33.	☐	☐ SNMP Network Management
INTERNETWORKING		
34.	☐	☐ Routers
35.	☐	☐ Hubs
36.	☐	☐ Intelligent Hubs
37.	☐	☐ Stackable Hubs
38.	☐	☐ Bridge/Router
39.	☐	☐ Bridges
40.	☐	☐ Gateways
41.	☐	☐ Concentrators/Repeaters
COMPUTERS/PERIPHERALS		
42.	☐	☐ Network Computers
43	☐	☐ Laptops/Notebooks/Sub-Notebooks
44.	☐	☐ Micros/PCs
45.	☐	☐ Minis
46.	☐	☐ Mainframes
47.	☐	☐ Workstations
48.	☐	☐ Printers/Network Printers
49.	☐	☐ CD-ROM
50.	☐	☐ Fax/Modem Boards
51.	☐	☐ Graphics/Multimedia/Audio/Video Boards
52.	☐	☐ Memory/Chips/Boards/Cards
REMOTE/WIRELESS COMPUTING		
53.	☐	☐ Remote Access Products
54.	☐	☐ Remote Access Services
55.	☐	☐ PDAs
56.	☐	☐ PCMCIA Devices
57.	☐	☐ Wireless Data Services
58.	☐	☐ Wireless Data Equipment
59.	☐	☐ Cellular Equipment & Services
SOFTWARE/APPLICATIONS		
60.	☐	☐ Network Management
61.	☐	☐ Systems Management
62.	☐	☐ Security
63.	☐	☐ Communications Software
64.	☐	☐ Terminal Emulation
65.	☐	☐ Operating Systems
66.	☐	☐ Applications Development Tools
67.	☐	☐ Database Management/RDBMS
68.	☐	☐ Groupware
69.	☐	☐ Workflow
70.	☐	☐ EDI
71.	☐	☐ E-mail
72.	☐	☐ Desktop Video Conferencing
73.	☐	☐ Imaging
74.	☐	☐ Suites/Server Suites (Back Office, etc.)
75.	☐	☐ Middleware
76.	☐	☐ Document Management
77.	☐	☐ Site Metering Tools
78.	☐	☐ Computer Telephony Integration (CTI)
79.	☐	☐ Data Warehousing
WIDE-AREA NETWORK EQUIPMENT & SERVICES		
80.	☐	☐ Modems
81.	☐	☐ Asynchronous Transfer Mode (ATM)
82.	☐	☐ Frame Relay Equipment/Services
83.	☐	☐ ISDN Equipment & Services
84.	☐	☐ FT-1/T-1/T-3 Multiplexers/Services
85.	☐	☐ DSL Services/Products
86.	☐	☐ SONET
87.	☐	☐ Inverse Multiplexers
88.	☐	☐ SMDS
89.	☐	☐ Diagnostic/Test Equipment
90.	☐	☐ DSU/CSU
91.	☐	☐ VSAT/Satellite
92.	☐	☐ PBXs
93.	☐	☐ Voice Mail/Response
94.	☐	☐ Videoconferencing
95.	☐	☐ Leased Lines
96.	☐	☐ Switched Data
97.	☐	☐ Virtual Networks
98.	☐	☐ Outsourcing/Systems Integration Services
99.	☐	☐ Education/Training Services
00.	☐	☐ None of the above (1 - 99)

9 Please indicate the platforms that are currently installed/planned:

(Check ALL that apply) A. Currently installed B. Planned for purchase

	A. Currently installed	B. Planned for purchase
NETWORK PROTOCOLS		
01.	☐	☐ TCP/IP
02.	☐	☐ IPv6
03.	☐	☐ SNA
04.	☐	☐ DECnet
05.	☐	☐ Novell IPX/SPX
06.	☐	☐ APPC/APPN/LU 6.2
07.	☐	☐ NETBIOS
08.	☐	☐ AppleTalk
09.	☐	☐ NFS
10.	☐	☐ Other *(please specify)* _____
LAN ENVIRONMENT		
11.	☐	☐ Gigabit Ethernet
12.	☐	☐ Switched Ethernet
13.	☐	☐ Fast Ethernet (100 Megabit Ethernet)
14.	☐	☐ Ethernet
15.	☐	☐ ATM
16.	☐	☐ Token Ring/Token Ring Switching
17.	☐	☐ IP Switching
18.	☐	☐ FDDI
19.	☐	☐ 100Base-T
20.	☐	☐ 10Base-T
21.	☐	☐ LocalTalk
22.	☐	☐ Fibre Channel
23.	☐	☐ 100vg Any LAN
24.	☐	☐ Other *(please specify)* _____
NETWORK OPERATING SYSTEM		
25.	☐	☐ Windows NT
26.	☐	☐ Windows NT/Advanced Server
27.	☐	☐ Novell IntranetWare
28.	☐	☐ Novell (NetWare 4.X)
29.	☐	☐ Novell (NetWare 2.X, 3.X)
30.	☐	☐ Microsoft (LAN Manager)
31.	☐	☐ LocalTalk (AppleTalk)
32.	☐	☐ Banyan (VINES)
33.	☐	☐ IBM (LAN Server)
34.	☐	☐ Artisoft (LANtastic)
35.	☐	☐ Other *(please specify)* _____
COMPUTER OPERATING SYSTEM		
36.	☐	☐ NT Server
37.	☐	☐ NT Workstation
38.	☐	☐ Unix/Xenix/AIX
39.	☐	☐ Solaris
40.	☐	☐ Windows
41.	☐	☐ Windows 95
42.	☐	☐ Windows 97
43.	☐	☐ DOS
44.	☐	☐ OS/2/OS/2 Warp
45.	☐	☐ IBM MVS/VM/VSE
46.	☐	☐ Digital VMS
47.	☐	☐ Macintosh
48.	☐	☐ Other *(please specify)* _____
49.	☐	☐ None of the above (1-48)

10 Which of the following Servers/Clients do you have installed/planned at your location? (check ALL that apply in each column)

		A. Servers	B. Clients			A. Servers	B. Clients
01.	Power PC	☐	☐	07.	486	☐	☐
02.	Power Mac	☐	☐	08.	386	☐	☐
03.	Mac Other	☐	☐	09.	286	☐	☐
04.	Multiprocessor Servers	☐	☐	10.	Risc	☐	☐
05.	P6/PII	☐	☐	11.	Alpha	☐	☐
06.	Pentium/Pentium Pro	☐	☐	12.	Other	☐	☐

11 Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

A - Mainframes (Large Scale) Installed/Planned
1. ☐ IBM
2. ☐ Amdahl
3. ☐ Cray
4. ☐ Hitachi
5. ☐ Unisys
6. ☐ Other _____

B - Minis (Midrange) Installed/Planned
1. ☐ IBM RS6000
2. ☐ IBM AS400
3. ☐ Digital
4. ☐ Tandem
5. ☐ Unisys
6. ☐ AT&T GIS
7. ☐ H-P
8. ☐ Data General
9. ☐ Other _____

C - Workstations Installed/Planned
1. ☐ Sun Microsystems
2. ☐ Silicon Graphics
3. ☐ Digital
4. ☐ H-P
5. ☐ IBM
6. ☐ Other _____

12 What is the estimated gross annual revenue of your entire company/ institution? (check one only)

01. ☐ $20 billion or more
02. ☐ $10 billion to $19.9 billion
03. ☐ $1 billion to $9.9 billion
04. ☐ $500 million to $999.9 million
05. ☐ $100 million to $499.9 million
06. ☐ $50 million to $99.9 million
07. ☐ $10 million to $49.9 million
08. ☐ $5 million to $9.9 million
09. ☐ $4.9 million or less
10. ☐ None of the above

13 For which areas outside of North America do you have purchase influence? (check ALL that apply)

1. ☐ Europe 2. ☐ Asia 3. ☐ South America 4. ☐ Australia 5. ☐ Middle East 6. ☐ None

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Briefs

■ **Ipsilon Networks, Inc.** *announced the IP Switch 6400, a high-density version of its* **IP Switch** *for Internet service providers.*

Ipsilon's *IP Switch 6400*

The IP Switch 6400 provides up to 10G bit/sec of bandwidth and supports up to 120 frame-based or 180 cell-based ports. Ipsilon's flow classification technology, coupled with hardware-based per-flow queuing, allows the IP Switch 6400 to control and allocate bandwidth dynamically, for guaranteed quality of service and support of service level agreements, Ipsilon said.

The IP Switch 6400 system starts at $24,500, including non-redundant switching fabric and power supply. The Pentium Pro-based IP Switch Processor line card is $6,000, and the four-port 10/100M bit/sec Ethernet Compact PCI card is $1,900. The four-port OC3 fabric-direct line card is $4,500 for multimode fiber and $9,000 for single-mode fiber.

© Ipsilon: (408) 990-2000

■ **Hewlett-Packard Co.** *has announced availability of HP* **OpenView Desktop Administrator,** *a scalable management product for desktops.*

Based on the Norton Administrator for Networks, which HP acquired in April, HP OpenView Desktop Administrator distributes software and performs inventory and configuration, software-license and remote control management, HP said. IT administrators can query and correlate data through software wizards and preconfigured charts and reports. They also can build their own views with an integrated version of Crystal Reports.

HP OpenView Desktop Administrator costs $67 per node for 250 to 2,500 nodes and $49 per node for more than 2,500. Site-license pricing also is available.

© HP: (800) 752-0900

NextPoint to manage key business applications

Digital Equipment Corp. refugees form company to focus on 'business-centric' management.

By Jim Duffy
Atlanta

NextPoint Networks, Inc. debuted at NetWorld+Interop 97 with a Web-based network management system designed to provide a "business-centric" view of network and application service levels.

By "business-centric," NextPoint means its software can provide network administrators and end users with the information they need to monitor the status of key business applications.

The Westford, Mass., start-up is attempting to bridge network operations and service management with real-time monitoring and historical analysis as well as network and business application performance, said William Maro, the company's president and CEO. Maro is a 10-year Digital Equipment Corp. veteran who most recently was vice president of network product marketing and engineering within the company's Network Product Business Unit. Last year, he started NextPoint with two other former Digital engineers.

Get more online:

- **Overviews of Web and Java-based management proposals**
- **A roundup of management-related announcements made at the recent NetWorld+Interop 97**

www.nwfusion.com

NextPoint's first product, dubbed NextPoint S^3, consists of Windows NT server software, distributed NT and Solaris agents and a Java-based user interface.

The agents collect network and application response time metrics, while the server, written in C++, provides an engine for real-time and historical analysis, as well as alarm and event handling. The Java interface features push technology for automated information distribution and access, and "channel" buttons for further detail.

NextPoint S^3 also can gather data from SNMP agents and Remote Monitoring probes.

NextPoint's software includes trademarked technology called Traffic Signatures and Synthetic Transactions. Traffic Signatures identifies historical patterns of variations in network traffic caused by business applications and employee work shifts. For example, if a server backup does not occur at the regularly scheduled time, Traffic Signatures identifies this anomaly and generates a real-time alarm. This enables the IS manager to respond to the problem immediately instead of noticing the aberration in a daily network performance report, Maro said.

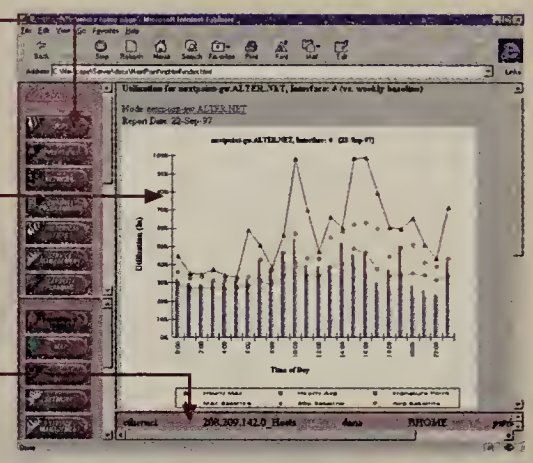
Synthetic Transactions is an agent-based feature that simulates application transactions to track end-to-end availability and response time. This feature can simulate Domain Name System name lookups, for example, as well as SAP AG R/3 and Oracle Corp. database transactions, NextPoint said.

See **NextPoint,** *page 36*

The NextPoint in network management

Features of NextPoint S^3:

- "Channel" buttons enable users to delve into performance and service management details.
- Traffic Signatures charts network traffic variance by actual, average, 90% and maximum utilization.
- An "exception ticker" quickly notifies users of critical events.



Vendor triumvirate team for class of service offering

By Tim Greene
Atlanta

3Com Corp., Newbridge Networks, Inc. and Siemens AG this month agreed to a standardized scheme that will guarantee class of service from desktop to desktop across IP WANs.

Under an initiative dubbed Carrier Scale Internetworking (CSI), the companies plan to implement new technology in their hardware and software that will help users extend LAN policy-based classes of service across the WAN.

The technology implemented under CSI relies on the Multi-Protocol over ATM (MPOA) standard that dictates how to forward IP, IPX and other protocols over ATM networks. CSI requires some nonstandard extensions of MPOA to map LAN class of service to ATM quality of service (QoS) standards.

The three companies invited others to join CSI, touting it as a way to ensure that users can establish wide area IP intranets with their existing LAN gear and still be sure they get the end-to-end performance levels they want.

CLASS OF SERVICE

Carrier Scale Internetworking — the 3Com, Siemens and Newbridge alliance — promises:

- End-to-end class of service guarantees for IP traffic across the WAN.
- Support for establishment of IP virtual private networks through closed user groups.
- Support for policy filters set by the user.
- Simpler carrier networks that can support multiprotocol traffic.

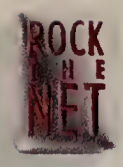
Tom Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J., said CSI will challenge other vendors to either join the initiative or come up with something better. "People want public IP networks and QoS to come together. This will focus attention on that and someone will come up with the right answer," Nolle said.

Under CSI, IP traffic is labeled for a certain class of service based on policies set by the system administrator. The label can be attached to the desired data via the network interface card in the user PC. The tag then is read at a service point where the policy information on the label is mapped to an ATM QoS.

A high-performance workstation acts as a routing service control point in the CSI architecture, establishing an appropriate switched virtual circuit (SVC) for each labeled IP flow. Information about the SVC is broadcast to service control points in the network so later packets with the same label can cut through the network with the appropriate service level.

The service point capability will be integrated in 3Com and Siemens/Newbridge products either through software or hardware upgrades. The first wave of those upgrades is expected by year-end.

While it is based on MPOA, CSI also requires extensions to MPOA. 3Com and Newbridge/Siemens will present the extensions to standards bodies for formal adoption. ■



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It's the world vs. Cisco

Such was IBM's dominance of computing a decade and more ago that multimillion-dollar businesses were built on the premise of luring away some small segment of IBM's customer base.

Rather than oppose IBM by offering competing architectures, these vendors leveraged de facto IBM standard environments to their own advantage. Amdahl did it with mainframes and front-end processors, Memorex-Telex with communications controllers and Computer Associates with utility software — just to name a few.

Such is Cisco's dominance of internetworking that it has now become a similar target. This year has seen an unprecedented number of attacks on Cisco's customer base by vendors looking to recreate the successes an earlier generation of vendors had against IBM. In 1997, The Tolly Group was commissioned to conduct at least a dozen competitive evaluations involving Cisco products. In 1996, there were none.

The strategies used by the aggressive third-party vendors vary little from those employed in the past against IBM. Typically, vendors implement one of three methods: outperform the target product, offer the same performance but lower price, or bypass — devise alternative methods of accomplishing the same goal as the target product.

Kevin Tolly

3Com and Digital over the past few months actively have been battling Cisco's Catalyst 5000 LAN switch. 3Com started things in May with a Fast Ethernet and FDDI benchmark pitting its Corebuilder 5000 against Cisco. Go online at The Tolly Group home page and call up Doc. 7277 (see below for URL). Earlier this month, Digital put its MultiSwitch 900/VN switch 900XX Fast Ethernet switch up against the Cisco and 3Com switches (Doc. 7302).

IBM even threw down the gauntlet in a massive test of mainframe channel-to-LAN connectivity (Doc. 7291 and 7292). Strange as it is to contemplate, IBM is the challenger in the fight to prove it is dominant in token ring-to-channel connectivity — both technologies IBM invented.

Also gaining much attention is the hand-to-hand combat going on between Ascend and Cisco in the ISP router space. The battle has seen the "leadership" position change hands several times over just a few months as each vendor deploys more powerful distributed routing solutions (Doc. 7286, 7295 and 7306).

Decidedly less dramatic but significant nonetheless is the "clone" option. We've seen only one of these in the lab so far, but what we've seen is impressive.

South Korean vendor Ssang Yong offers a pair of products — the SR-2501 router and the SR-2505 RUB (router/hub) — that match the Cisco equivalents in every way but price (Doc. 7276).

It is a sign of maturity in the industry that the third-party plug-compatible market now is burgeoning. While it initially may appear to make matters more complicated, in the long run, it will certainly drive down prices and increase network managers' choices.

Who could ask for anything more?

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300 or ktolly@tolly.com or www.tolly.com.

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- *Network Computing* recognized Cabletron's SmartSwitches with its "Editor's Choice" and "Editor Refuses to Give it Back" awards based on industry-leading speed and ease-of-use.

- In a lab test among leading switches, *Communications Week* gave the SmartSwitches its "Max Award" proclaiming Cabletron "...the only vendor to have fully implemented the use of policy-based VLANs."

- After a study conducted by the Harvard Network Device Test Lab, Scott Bradner remarked that the Fast Ethernet SmartSwitch was "...the fastest internetworking device I have yet seen."

- And in another test of leading Ethernet and Fast Ethernet solutions, the Tolly Group found the SmartSwitch offers outstanding VLAN and RMON support.

- Cabletron scored highest in VLAN management in McConnell Consulting's "VLANs: Head-to-Head," a comprehensive evaluation of 12 leading vendors' solutions.

- During the Switching Showdown at Comnet '97, Cabletron garnered over 50% of the vote in a *Network World* audience poll.

- For the second year in a row, *Network Magazine* (formerly *LAN Magazine*) awarded Cabletron's SPECTRUM enterprise management solution its 1997 Product of the Year in the category of Management Platform.

- In WAN switching, Cabletron's FRX4000 frame relay solution from CSI Netlink won the annual "Tester's Choice" award handed out by *Data Communications.*

Cabletron's award-winning team is proud of the recognition it has earned from pundits and publications alike. And if our solutions excel in a closely watched lab environment, imagine how they perform in customers' real-world business networks. We're simply honored about passing that test.

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THIS JUST IN ...

- Cabletron's SmartSwitch wins Network World's 1997 Intranet Excellence Award in the Infrastructure category.

- Data Communications recognizes SmartSwitches and SecureFast with its "Tester's Choice" award saying the solution "works with every type of VLAN and makes management a breeze."

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CA, Tivoli enhance wares

By Jim Duffy
Atlanta

Enterprise management rivals Computer Associates International, Inc. (CA) and Tivoli Systems, Inc. unveiled at NetWorld+ Interop 97 extensions to their respective products that broaden device support and scalability.

CA announced the availability of Unicenter TNG 2.1, which now can discover and manage problems with Novell, Inc.'s NetWare IPX networks and collect desktop configuration data from the Desktop Management Task Force's Desktop Management Interface 2.0 agents.

Other features of Unicenter TNG 2.1 include the following:

- More detailed monitoring, trend and analysis capabilities.
- "Out-of-the-box" integration of Hewlett-Packard Co.'s ClusterView and Netserver Assistant; NCR Corp.'s LifeKeeper; Compaq Computer Corp.'s Insight Manager; and Cisco Systems, Inc.'s network policy facilities.
- Integrated DCE/Kerberos encryption functions.
- Enhanced event correlation.

Pricing for Unicenter TNG 2.1 starts at $2,500.

Tivoli announced two new versions of the TME 10 NetView network management line that feature Web-based interfaces, enhanced scalability and tighter integration with the company's management framework.

The new products include TME 10 NetView V5 and TME 10 NetView for OS/390. TME 10 NetView for OS/390 provides integrated management of centralized IBM System/390 and distributed client/server environments. TME 10 NetView V5 enables users to discover TCP/IP networks, display network topologies, correlate and manage events and SNMP traps, monitor network health and gather performance data.

TME 10 NetView V5 includes a Java-based Web browser interface for cross-platform access to management information, such as topology maps, SNMP events and node status.

For scalability, TME 10 NetView products now can be deployed in a three-tiered architecture that combines TME 10 NetView for OS/390 with Central and Regional TME 10 NetView Servers.

The Central NetView Server, which runs on Unix servers, performs event correlation and filtering. Regional NetView Servers, running Windows NT and Unix, perform attended or unattended management of remote offices.

Both TME 10 NetView V5 and TME 10 NetView for OS/390 feature enhanced integration with the TME 10 Enterprise Console (TEC) and TME 10 Framework, which enables users to manage both systems and networks through a consistent, policy-based interface, Tivoli said. This allows administrators to effect changes across multiple remote sites in a single step.

TME 10 NetView for OS/390 is available immediately. TME 10 NetView V5 will be available in November. TME 10 NetView V5 costs $5,000 per server when managing less than 1,000 nodes, and $15,000 when managing 1000 or more nodes.

✆ CA: (516) 342-5224; Tivoli: (512) 436-8000

Big Blue offers new flavor of Java management

By Marc Songini
Atlanta

IBM recently announced its new Java network management suite for its Advanced Interactive eXecutive (AIX) systems.

As expected, the new Nways Manager for AIX lets users remotely manage network devices and monitor system performance with campus management software (*NW*, Sept. 8, page 1). Using the new package, a network administrator can manage devices and monitor network performance in real time from any Web browser.

Nways Manager for AIX

New features:

- Performance management
- Traffic monitoring
- Data polling
- Management support for 2210 and 2216 devices

The AIX package includes Campus Manager LAN and Campus Manager ATM, which manage LAN and ATM devices and run on IBM subsidiary Tivoli Systems, Inc.'s TME-10 NetView for AIX platform. It also includes the Campus Manager Remote Monitor and Traffic Monitor, which handle performance monitoring.

Together, the components are designed to execute performance management functions, allowing administrators to study network traffic patterns and locate bottlenecks.

The network statistics are compiled into a Java Database Connectivity-compliant database that is included in the management software and used to chart performance trends. The program also will alert the administrator when a network device is being overloaded.

IBM's announcement also included:

- Management support for the 2210 Nways Multiprotocol Router, the 2216 Multiaccess Connector, and Ethernet and Token-Ring adapter cards.
- Java-based intelligent agents that off-load data polling from the control console to increase bandwidth and improve connectivity to the server.
- Performance monitoring functions for the 8210 Nways Multiprotocol Switched Services Server, 8273 Nways Ethernet RouteSwitch and generic SNMP devices.

"IBM's Web-based network management products afford network administrators the flexibility to manage their infrastructure both locally and remotely through the Internet," said Louise Terry, general manager of IBM's Networking Hardware Division.

David Maddox, network manager at Truman Medical Center, in Kansas City, Mo., is looking forward to testing the product. He manages a network of 800 clients at the nonprofit teaching hospital.

"I have a small staff. The thing that appealed to me more than anything about the product is that it gives me and my guys an opportunity to get out and do some training and other things and still maintain the network through a Web browser," Maddox said.

The product will be available Nov. 21. Pricing for the Nways Manager for AIX starts at $8,000. The Campus Manager LAN costs $15,000.

✆ IBM: (800) 426-3333

Keeping an eye on frame relay performance

By Tim Greene

New products for keeping frame relay vendors honest are starting to pour into the market.

Recently, vendors Adtran, Inc., Kaspia Systems, Inc. and Micromuse, Inc. released new hardware and software offerings that let users measure the services they are getting from their frame relay carriers.

"When you get performance reports from the carrier, you are al-ways a little skeptical about the source of the data," said Michael Kaltenbaugh, director of enterprise multimedia communications at Columbia Gas System, of Reston, Va., which has a 110-node frame relay network spanning 14 states.

NEED TO KNOW

If you have a frame relay service level agreement with a carrier, you need to measure:

- Network availability
- Network delay
- Effective throughput
- Congestion, as measured by discard-eligible packets

With probes in your own network or software that pieces together network performance from existing network devices, you can generate reports that verify carrier performance and help troubleshoot problems from within the enterprise, Kaltenbaugh said.

Adtran has entered the arena of smart DSUs/CSUs that incorporate probes that gather network performance data at each WAN node and compile it. Data collected by Adtran's new DSU IQ hardware measures throughput, bandwidth use, bursting, congestion and delay.

Users can combine DSU IQ with IQ View monitoring software to produce graphical reports that can be used for network planning and ensuring carriers honor service level agreements. The data is stored in standard SNMP format; it can be integrated with third-party monitoring software to generate similar reports.

IQ View runs on a Microsoft Corp. Windows 95- or NT-based workstation. The DSU IQ, available now, costs $995 per node. IQ View costs $2,500 and will be available in the fourth quarter.

For users who do not want the expense of adding smart DSUs/CSUs to their frame relay networks, Kaspia announced Frame Relay Audit System software. It taps Management Information Bases (MIB) in routers and other network devices and compiles the MIB data into reports.

The Frame Relay Audit System runs on a stand-alone Windows NT workstation. The package is based on Kaspia's existing Automated Network Monitoring System but has been enhanced to support point-to-point monitoring of frame relay circuits. The Frame Relay Audit System costs $5,000 and is available now.

Kaspia also has teamed up with Micromuse to integrate its own software with Micromuse's NetCool EventLists. Alone, Kaspia performs only historical analysis, but NetCool adds the ability to display real-time network activity to help analyze current problems.

EventLists costs $15,000 per server and $1,500 per client. It is available now.

✆ Kaspia: (503) 644-1800; Adtran: (205) 971-8000; Micromuse: (212) 758-1222

NextPoint

Continued from page 29

management products on the market today, but company officials claimed the current offerings are point products incapable of integrating service level and operations management, historical and real-time analysis, and network and applications monitoring. Nonetheless, NextPoint S^3 will forward events and alerts to platforms like HP OpenView.

NextPoint's main competition will come from management reporting mainstays such as Concord Communications, Inc. and Kaspia Systems, Inc., and network and application monitoring mavens like Network General Corp. and Optimal Networks, Inc.

NextPoint S^3 costs from $15,000 to $70,000 and will be available in the first quarter of 1998.

✆ NextPoint: (508) 392-2026

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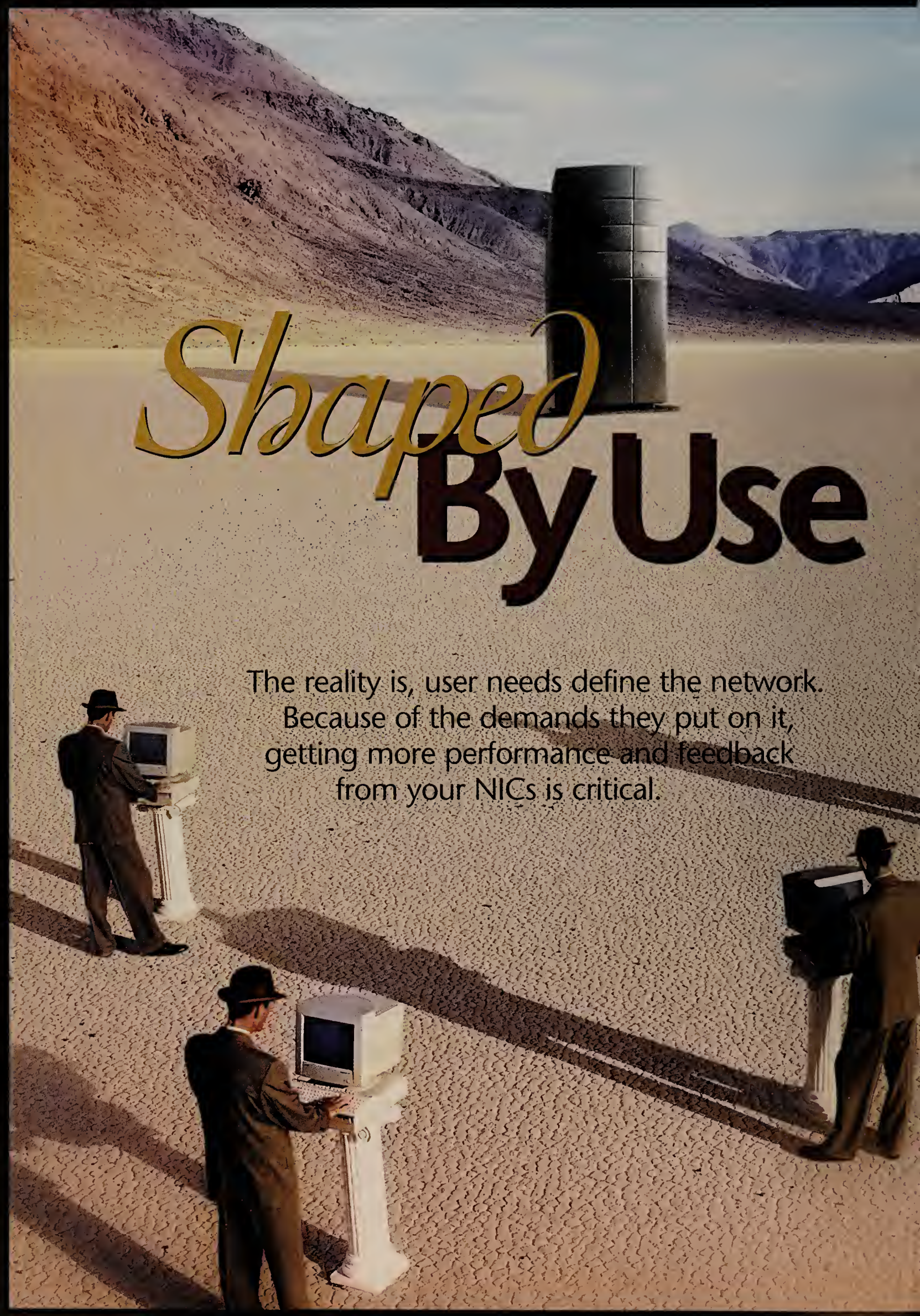
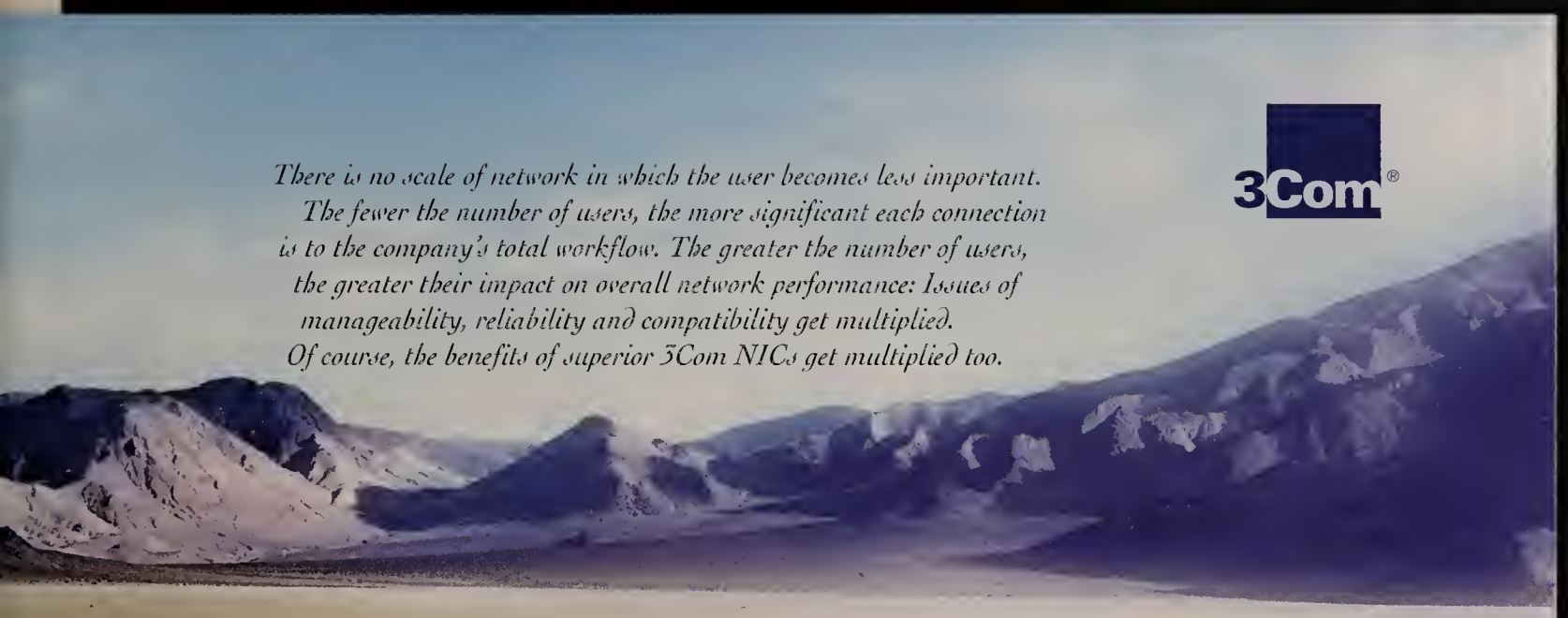

Shaped
By Use
The reality is, user needs define the network.
Because of the demands they put on it,
getting more performance and feedback
from your NICs is critical.



There is no scale of network in which the user becomes less important. The fewer the number of users, the more significant each connection is to the company's total workflow. The greater the number of users, the greater their impact on overall network performance: Issues of manageability, reliability and compatibility get multiplied. Of course, the benefits of superior 3Com NICs get multiplied too.

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BUILT FOR PERFORMANCE.

Networks grow the way users' needs make them grow. But new Fast Ethernet connections still need to talk to existing 10 Mbps users. And emerging Gigabit users and ATM- connected servers need to talk to them both. The network suddenly includes remote users, and all the variables they feed into the network. You might think the only place you can manage performance is in the wiring closets. But you can assure better throughput, fewer crashes, and greater control with the right network interface cards. 3Com Network Interface Cards (NICs) let you handle performance, reliability, and compatibility at the user level. So fewer demands are placed on the central equipment...and on the people who manage it.

EVERY NIC AN ASSISTANT.

Once you are no longer fighting fires, you are free to proactively optimize your network's activity. To do that, you need feedback that runs deeper than "connected" or "broken". This is where 3Com NIC intelligence can make a huge difference. It can be employed to feed information back to management and even execute network administrative functions where the network is working: at the user. This ensures optimal network performance and efficiency.

LIFE AT THE EDGE.

3Com's NIC technology has come to today's advanced state in incremental steps – based on real-world experience. Yes, 3Com started the NIC industry. But that's not why it continues to lead it. Each new 3Com product must be better than any alternative. In reliability. In compatibility. In value. And in performance. The following pages may hold the answer to issues you're wrestling with right now. At a minimum, they might give you a new approach. The beginning of your solution may be at the edge of your network.

Every working day, system managers add 165,000 users to networks. These users might be anywhere on the globe (some distance from the nearest MIS support). They will employ a variety of applications generating a variety of file types. Obviously, the distribution and demands of the network are shaped by the users. But when central equipment looks out at this activity, all it can see are the NICs.

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Performance^3

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Left Behind

3Com NICs with DynamicAccess™ software help you get top performance out of the network you have. And get you ready for what's coming next.

Every dime spent on network interface cards is an investment in the network. If treated like a glorified cable jack, your NIC expenditure is just another sunk cost. If your NICs possess intelligent upgradable features, your investment has a future. And if those intelligent features raise the total capacity of the network, your NIC investment can start paying dividends instantly.

CLASS OF SERVICE: WHAT GETS PRIORITY?
The surest sign of intelligence is knowing what's important and what's not. 3Com NICs with DynamicAccess software Class of Service (utilizing IEEE standards) let you give priority to time-sensitive data: business critical information streaming or multimedia gets through ahead of store-and-forward data like email and print jobs. This feature can instantly deliver dramatic improvements in network responsiveness.

MANAGERS NEED AGENTS IN THE FIELD.
DynamicAccess software, using Efficient Multicast Control, is able to conserve precious network bandwidth. It automatically sets network switch filters to head-off traffic jams and improve network performance to the user. But even the most self-correcting network demands central management. How do you do that without an analyzer on every segment? Put an agent with every user. DynamicAccess software features include distributed RMON SmartAgent® software which can put your entire network under the review and command of any RMON- or RMON2- compliant management application.

NOW, SPEED UP EVERYTHING.
With more network traffic travelling via intranets and across IP subnets, router performance can fall victim to forces beyond your control, unless your NICs are smart enough to take control. DynamicAccess Fast IP client software activates the router just once and then bypasses it to maintain line speed... working with any vendors' switches and routers, and with firewalls and management functions undiminished.

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With a technical and market lead in Fast Ethernet NICs, new Gigabit products, or x2™ technology to accelerate modem access, 3Com is constantly pushing the performance envelope. That's why praise for 3Com NICs by industry and technology experts is matched by a global lead in market share and customer loyalty.

A STANDARD AMID STANDARDS.
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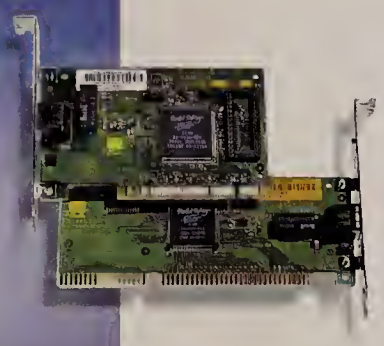
Solutions[3]



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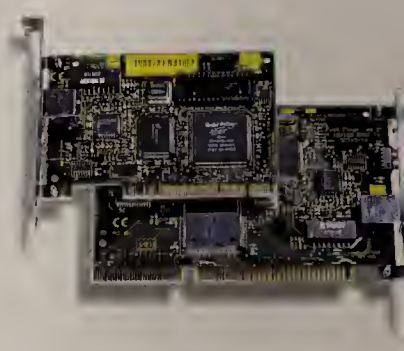

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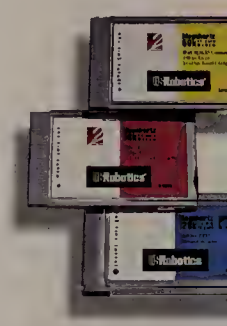

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Briefs

MCI Communications Corp. *has become the first of the major long-distance carriers to announce* **frame relay switched virtual circuits (SVC).** *SVCs enable users to establish temporary frame relay connections on demand to another location inside or outside the user company, as long as the other site has a dedicated access line or ISDN access to an MCI central office.*

The connections can be activated within minutes via E.164 addressing, a format similar to phone numbers.

MCI's SVCs support bandwidth up to 6M bit/sec, but the carrier said it will not release pricing until the service becomes available in December.

■ *Several ISPs are evaluating a multimedia conferencing server for possible deployment of a* **standards-based conferencing service.** *White Pine Software, Inc., of Nashua, N.H., said its MeetingPoint server is being tested by GTE Internetworking, UUNET Technologies, Inc., CompuServe, Inc., Concentric Network Corp. and others for deployment of IP-based multipoint desktop videoconferencing.*

Such a service would enable any user with H.323-compliant PC software, such as Microsoft Corp.'s NetMeeting or White Pine's own CU-SeeMe, to interact through the ISP's MeetingPoint server.

■ **Omnipoint Communications, Inc.** *last week began offering* **personal communications services (PCS)** *digital wireless service in Atlantic City, N.J., Scranton/Wilkes-Barre, Pa. and the Lehigh Valley area of Pennsylvania.*

Omnipoint had introduced PCS service in Philadelphia last month. The carrier is using the Global System for Mobile (GSM) wireless protocol for the service offering.

New pay-phone ruling upsets AT&T

By David Rohde
Washington, D.C

Promises by long-distance carriers to rescind recent increases in 800 voice and data dial-up rates likely will be deferred following a new ruling by the Federal Communications Commission.

The FCC has voted to give local exchange carriers and independent owners of pay telephones a new compensation rate of 28.4 cents per call for all toll-free and other coinless calls placed from their phones. The pay-phone owners will receive the compensation chiefly from long-distance carriers, which have been passing such charges along to users in the form of rate hikes on all 800 and 888 calls.

The FCC earlier this year set the pay-phone compensation rate at 35 cents per call, but that rate was overturned by a federal appeals court, which ordered the FCC to try again (*NW*, July 14, page 27). AT&T had demanded that the FCC reduce the rate to no more than 11 cents. Other carriers such as Sprint Corp. and WorldCom, Inc. suggested even lower figures.

AT&T reacted bitterly to the latest decision. "There is no sound economic data to support granting these [pay-phone] owners 28.4 cents per call," said Rick Bailey, AT&T vice president for federal government affairs. "The FCC is apparently intent on rewarding the pay-phone industry on the backs of customers, who will bear the brunt of this decision."

AT&T had promised to take back its 800 rate increases — which apply equally to dial connections for computer networks and to ordinary 800 voice calls — if the FCC significantly chopped the compensation rate. Now that seems highly unlikely. AT&T last hiked its 800 and 888 rates by 7% in May, on top of smaller increases earlier in the year. Bailey hinted that AT&T will take the matter back to court.

The prospect of continuing acrimony over the toll-free pay-phone compensation issue comes as the industry struggles to maintain the availability of new toll-free numbers. The FCC has implemented a plan to make sure the newly popular 888 numbers do not run out before next April, when the next toll-free area code — 877 — is slated to go into effect. Until then, large carriers will be allowed only to assign new numbers at the weekly rate of .95% of the 888 numbers they had in working status as of Aug. 23. Smaller carriers will be limited to 250 new numbers per week.

New numbering guru

Dealing with all these and related issues will be a new administrator of the nation's telephone numbering system. The FCC earlier this month selected a division of Lockheed Martin Corp. to replace Bell Communications Research as the North American Numbering Plan Administrator (NANPA).

The FCC's action culminates a five-year process of finding a successor to Bellcore, which was judged too partial to regional Bell operating companies to allocate sufficient phone numbers to alternative local carriers and their customers. ■

The toll-free cup runneth over

Facts about toll-free numbers:

Total possible number of 800 and 888 codes:	15.2 million
Percentage of available 800 and 888 codes in use:	85%
Number of 888 codes unavailable because of conflicts with 800 vanity numbers:	372,000

SOURCE: FCC, WASHINGTON, D.C.

New UUNET services target high-volume Web sites

By David Rohde
Atlanta

UUNET Technologies, Inc. has introduced two services designed for users whose Web sites generate extremely high levels of traffic.

The price of getting closer to the 'Net

For its Co-Location service, UUNET charges for putting your Web server hardware in its data center and for providing bandwidth from the data center out to the Internet.

Equipment space	Monthly price	Bandwidth speed	Monthly price
Half cabinet	$1,100	3M bit/sec	$5,700
Standard cabinet	$2,000	10M bit/sec	$12,000
Large cabinet	$2,500	45M bit/sec	$59,000
		100M bit/sec	$128,000

Other speeds, including burstable options, are available. Two hours of on-site technical support per month is included, with additional support available for an hourly fee.

At the NetWorld+Interop 97 show in Atlanta, UUNET Technologies, the Internet unit of WorldCom, Inc., announced the release of UUNET OCDirect, the first OC-3, or 155M bit/sec, Internet access service. The service initially is available in New York, Washington, D.C. and San Francisco, where UUNET has constructed OC-12 Synchronous Optical Network (SONET) connections from its hubs to the Internet.

The OCDirect service itself is ATM-based, meaning users must install a router on premises with an ATM interface on the WAN side to communicate with UUNET's ATM switches.

The connection back to the Web server does not need to be in ATM cell format because UUNET will support 10M and 100M Ethernet LAN-side connections as well as FDDI.

In addition, users do not need to purchase the full OC-3 access pipe. This is because UUNET generally is offering the service in 10M increments starting at 60M bit/sec.

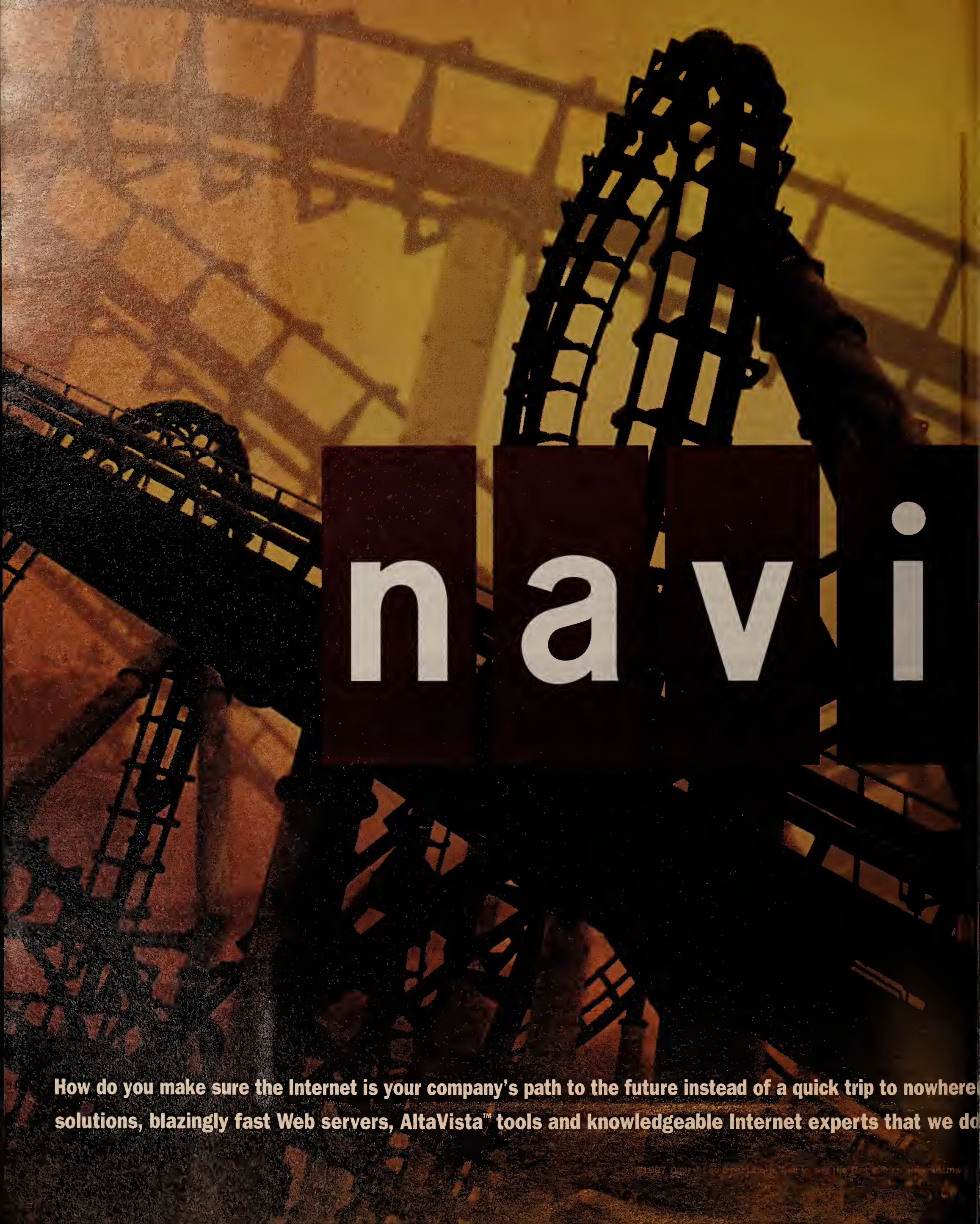
Nevertheless, the entry price is stiff, starting at $78,000 per month for 60M bit/sec access and rising to $179,000 per month for 155M bit/sec. For users that must purchase a compatible router, UUNET offers Cisco Systems, Inc. Models 7204 and 7206 for a one-time charge from $22,000 to $26,000, including configuration.

Also at Interop, UUNET became the second major Internet service provider to introduce an option allowing users to place their servers in the ISP's data center without ceding ownership of the server hardware or Web applications to the provider.

The goal of the new Internet Server Co-Location service is to provide high-bandwidth connectivity directly to UUNET's Internet backbone without the need for a local-access loop from the customer premises.

Alternatively, users can employ the service to mirror their Web sites at a UUNET data center.

The service is available at UUNET's data centers in Vienna, Va. and Palo Alto, Calif. Prices vary depending on the size of the cabinet selected for the Web server and the chosen connection speed to the Internet (see graphic). ■



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EYE ON THE CARRIERS

RBOCs are knocking on the door

Right now MCI may look like the puck in a hockey match between British Telecommunications and WorldCom. But it still has to try to make money by advertising its services. And its new offer to residential customers of five cents per minute on Sundays is telling indeed — for businesses and consumers alike.

Telecom prices usually drop not after new competition arrives, but just before. California residents may recall the scramble three years ago leading up to the introduction of competition for toll calls within the state's 10 regional calling areas. Originally, Pacific Bell and GTE held a monopoly on such calls and charged ludicrously high prices. But after state regulators announced that AT&T, MCI and Sprint would be able to enter the market on Jan. 1, 1995, the local carriers, during the second half of 1994, lowered their short-haul toll prices by as much as 40%.

David Rohde

Now the same thing's happening in reverse. For the first 18 months following the enactment of the Telecommunications Act of 1996, the long-distance carriers laughed off the Bell companies' threats to enter the long-distance business, all the while maintaining their own silly pricing games.

Now MCI with its five-cent Sundays and Sprint with its free Mondays are signaling that they know the regional Bell operating companies (RBOC) are knocking at the door. What's changed? Three things:

- When the Federal Communications Commission recently turned down Ameritech's application to enter the long-distance market in Michigan, it didn't bash Ameritech for submitting a spurious application. Instead, the FCC praised Ameritech for its work on local competition and said the RBOC was close to meeting the legal requirements needed to break into long distance.
- Fed-up members of Congress are pushing the FCC to give the RBOCs a chance. They've bought the RBOC line that competition isn't happening because the long-distance carriers aren't trying.
- Four new commissioners are about to arrive at the FCC. The RBOCs believe the new crew will be more amenable to their wishes.

For corporate network managers, the impending breakout of RBOCs into long distance holds some uncertainties. Freed of arbitrary distance restrictions, RBOCs finally could build comprehensive data networks without awkward point-to-point link-ups between frame relay clouds or feature-robbing network-to-network interconnections with other carriers.

The problem is RBOCs could end up doing the same thing the wireless carriers did — talk a country mile about broadband data services and then do nothing but sell phone calls.

That ought not happen this time around. The wireless carriers have paid dearly for their licenses, fought endless zoning battles and spent jillions building their nets. So they've had to go after the mass market to recover their investment. By contrast, entering the long-distance biz is a cinch. All you have to do is buy discount capacity on someone else's network and mark it up a penny or two a minute.

Will the RBOCs spend their capital and intellectual energy on high-capacity transport and enterprise network services? It's tough to tell for sure. But at least we may finally soon find out.

Rohde is Network World's *senior editor of Carriers & ISPs. He can be reached at david_rohde@nww.com.*

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Briefs

■ **Netscape Communications Corp.** *has named* **Eric Hahn,** *who has been on sabbatical from the company, as chief technology officer and executive vice president. Netscape cofounder* **Marc Andreessen** *had been CTO but recently was named executive vice president of products, charged with overseeing Netscape's growing products divisions.*

Hahn started at the Mountain View, Calif.-based company in November 1995 when Netscape acquired groupware vendor Collabra Software, Inc., which Hahn founded and led as CEO. He previously was senior vice president and general manager of Netscape's Server Products Division.

■ *The* **U.S Department of the Treasury** *and* **BankBoston** *have embarked on an ambitious* **electronic commerce** *project. Under the pilot project, the Treasury Department will issue electronic checks to customers over the Internet. Customers can deposit the checks at BankBoston using IBM's Electronic Check Bank Server as the front end to legacy check-issuing systems.*

NationsBank Corp. *also plans to join the pilot project by year-end.*

The project is being organized with the help of the Financial Services Technology Consortium, an industry trade group.

■ **Hummingbird Communications, Ltd.** *has begun shipping* **Common Ground Web Publisher 4.0,** *a server-based suite of Windows NT applications that lets Webmasters create documents and publish them on a Web server.*

New features in Version 4.0 are a Java-powered viewer that eliminates the need for platform-specific document readers or plug-ins, as well as a Web search and indexing engine. The product costs $4,995.

✆ Hummingbird: (416) 496-2200

Feds plan for hack attacks

By Ellen Messmer
Washington, D.C.

A report on how the nation should prepare for a major cyberspace attack was presented to President Clinton last week. Its main plea is that the entire networking industry — users and vendors alike — share sensitive security information with the government.

According to intelligence agencies such as the National Security Agency, within the next decade, the U.S. is likely to be subject to an information warfare attack on its network infrastructure. The fear is that terrorists or hostile nations will use advanced electronics or hacker techniques to disrupt communications.

Tom Marsh, *chairman of the Commission on Critical Infrastructure Protection*

The fact that the military has little control over the nation's expanding telecommunications and Internet infrastructure has forced an unusual request: Tell us everything you know, because otherwise we can't protect you.

"We need to know how many times systems are under attack," said John Davis, director of the National Security Agency's National Computer Security Center at Fort Meade, Md. "The government alone can't be the support for this."

Instead, the U.S. government needs the cooperation of the private-sector industries deemed the most strategic. These include banking, power, gas and water suppliers and the entire networking industry, from service providers to software vendors.

"The reason the president brought us together was while a catastrophic cyberattack has not occurred, the time to act is now," said Tom Marsh, retired four-star general and chairman of the president's Commission on Critical Infrastructure Protection. The commission issued the report after 18 months of meeting with 6,000 people in government and industry.

"We want to lay the foundation for a public-private partnership."

But will the banks, power and gas companies, network service providers and Silicon Valley software industry be willing to share what could be embarrassing information that might hurt their competitive standing?

They should at least consider cooperating for the sake of national security, said Nancy Wong, manager of information assets at Pacific Gas & Electric Co. She is in charge of security for 700 servers and 70,000 desktop computers on a large backbone network.

"Certainly, it's a question of what they want to know, and there is a lot of concern," Wong said. She was given time off to participate full-time on the commission because she believed it would be patriotic to take on the assignment.

The commission's report is seeking voluntary cooperation by private industries to establish a clearinghouse and a legal framework under which sensitive information could be shared between the government and industry. ■

Preparing for cyberspace attacks

In addition to appealing to industry for cooperation, the report to President Clinton also will call for:

- A National Information Assurance Council where CIOs from the private sector can meet on the policy-making level
- Information clearing centers for protecting network-vulnerability information
- A Public/Private Information Sharing and Analysis Warning Center to be staffed by the public and private sector
- A White House Office of National Information Assurance
- A Sector Information Assurance Clearinghouse for each industry sector
- The federal budget to include $250 million per year, increasing to $500 million over five years, for computer security research and purchases

Mitsubishi sets up 'Net delivery business

By Ellen Messmer
Newton, Mass.

Mitsubishi Electronics America, Inc. wants to be the Federal Express of cyberspace. It is offering a service that guarantees secure delivery of CAD/ CAM and other large files over the Internet.

The Japanese electronics giant's new e-Parcel division next month will begin offering an eponymous service at a cost ranging from a few dollars to just under $20 for guaranteed on-time delivery of large files. In addition, e-Parcel will sell the proprietary server software that anchors its e-Parcel service to large corporations for use internally or with their trading partners.

The electronic delivery method solves the problem of incomplete file transfers, system freezes and security issues that can make sending important files across the Internet a risky venture, said e-Parcel President Hiroshi Kobota.

E-Parcel customers will have to install the Windows-based client software, which uses a proprietary method for uploading and transmitting files to an e-Parcel server. Senders simply execute a drag-and-drop command on the files they wish to send, typing in the e-mail address of the recipient. The e-mail address is mapped to the recipient's desktop IP address, and the file is sent using a proprietary type of encrypted transfer.

The e-Parcel server stores the data in a virtual warehouse on the Internet or within an intranet before sending it to the intended recipient, Kobota said.

Mitsubishi Electronics America's *e-Parcel service lets you securely distribute any size or type of digitized material over the Internet or intranet.*

In the U.S., Internet service provider Digex Corp. will act as the behind-the-scenes virtual warehouse. In Japan, the Toyota Group will act as a warehouse and as a licensed e-Parcel service provider.

The service also can transfer files through firewalls using standard HTTP, but it is not as fast as the proprietary e-Parcel method, according to John Summers, e-Parcel's marketing director.

It remains to be seen whether corporations will buy into the e-Parcel guaranteed-delivery idea. However, e-Parcel executives claim the automobile industry, some software vendors and publishers such as *The Boston Globe* are evaluating it for delivering large data files.

In addition to its file-delivery service, e-Parcel also announced desktop management software called Smart Consultant that lets network managers distribute and install software over the corporate intranet to users' PCs.

Once the Smart Consultant client software is installed on the PC, a manager can remotely scan the computer for its contents and run diagnostics testing and repairs. The company has not yet announced pricing or availability.

✆ e-Parcel: (617) 964-5566

'NET INSIDER

Hype and reality in Atlanta

Earlier this month, I spent part of a week wandering around the show floor at NetWorld+Interop 97 in Atlanta. Weep not for the marketers, for they are healthy and perfecting the art of loud, shrill, data-free presentations.

I've been to more Interop shows than I care to remember, but I cannot remember one at which the antics that some vendors used to attract people to their booths were so intrusive and so unrelated to whatever product was being hyped.

Christopher Columbus, complete with an antique globe, tried to convince passers-by that someone from the 1400s might know something about technology of the late 1990s. A magician cheated at card tricks while saying he was being truthful about some gadget. Skydivers yelled, race car drivers signed autographs and women, whose skirt lengths seemed inversely proportional to the value of the contents of their booths, handed out buttons and flyers.

All in all, a depressing comment on the maturity of the data communications market.

If one were able to stand the din and distractions long enough to survey the seemingly acres of floor space, one thing clearly stood out — Gigabit Ethernet. It seemed like there was no place at that show where one could stand without seeing a sign that included the words "Gigabit Ethernet."

There were Gigabit Ethernet network interface cards, Gigabit Ethernet switches, Gigabit Ethernet switching-routers, Gigabit Ethernet Layer 3 switches, Gigabit Ethernet routers, Gigabit Ethernet testers, Gigabit Ethernet analyzers. I was half expecting to see a Gigabit Ethernet interface for a Coca-Cola machine given that the show took place in Coke's hometown.

Scott Bradner

In spite of the omnipresent purveyors of hype, there was something there. Whereas at NetWorld+ Interop last spring in Las Vegas there were a couple of dozen mostly empty boxes labeled Gigabit Ethernet, this stuff was real.

We are starting to see Gigabit Ethernet products in the Harvard Network Device Test Lab. See www.ndtl.harvard.edu/ndtl/results/data/Extreme—Networks/Summit2/tx2txv2lb1g-16.ip for the test results of a Gigabit Ethernet switch/router device routing IP traffic at 2.38 million packet/sec. The speed is limited by the number of tester ports we have, not by the device itself.

I expect we will see quite a few more Gigabit Ethernet products over the next few months. This technology has gone from a glimmer in someone's eye into the hands of vendors that are not afraid to have their products tested by an independent test lab. That's an astonishing achievement. And you can actually buy some of these devices.

These are not just fast dumb boxes — many of them include all sorts of quality of service controls. Other products have security filters or can do Level-4-based (read: application-based) forwarding.

Remember, these are only first-generation products. I can hardly imagine what Interop Vegas will be like next spring.

Disclaimer: Harvard don't do nuthin' dumb. Anyway these are my own painful or surprised observations.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via e-mail at sob@harvard.edu.

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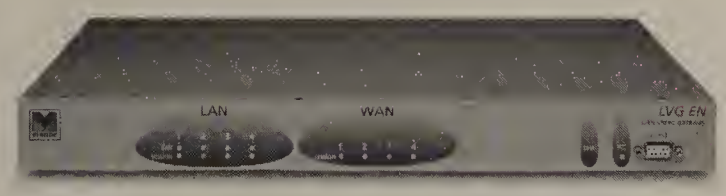

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SPECIAL FOCUS

Multimedia applications

The spreading of IP Multicast

By Chris Nerney

Though IP Multicast has made great strides this year, the bandwidth-conserving technology is not yet widely deployed on the Internet or within corporate networks.

That, however, could change by the end of next year.

A series of significant deals and announcements by major vendors and customers over the past few months indicate the technology is beginning to make inroads in corporate networks and with Internet service providers.

In September alone, UUNET Technologies, Inc. and several other major ISPs announced they have begun offering IP Multicast services to some commercial and dial-up customers.

IPMI's *Milne*

"It's like a sudden watershed of activity," says Karen Milne, president of the IP Multicast Initiative (IPMI), an industry consortium launched a year ago to hasten the technology's adoption.

Proponents say IP Multicast's main selling points are it saves on bandwidth and can deliver multimedia information fast.

Traditional TCP/IP unicast technology creates a point-to-point datastream between the sender and each receiver, which means there is one transmission for every user request.

Multicast, by contrast, sends a single stream of packetized data that can be accessed by any recipient, eliminating multiple transmissions of the same information across the Internet.

For this reason, IP Multicast can be ideal for bandwidth-hogging multimedia applications such as video and audio conferencing, large-file transfer and software distribution.

Looking for a few good ISPs

Last January, at the first IP Multicast Summit in San Jose, Calif., IPMI founders said ISPs needed to support the technology in order for it to be widely deployed. IPMI members are now seeing their wish come true.

"We're starting to see tangible, commercial implementation of IP Multicast services from ISPs," says Martin Hall, chief technology officer at Stardust Technologies, Inc., the Campbell, Calif.-based marketing and testing company that conceived IPMI and runs the organization as one of its two divisions.

Still, none of the large ISPs are offering IP Multicast to all their customers. That's because they still haven't worked out a way to charge users for the technology, according to Ted Julian, an analyst at International Data Corp., of Framingham, Mass.

"Even if ISPs have a way technically to deliver it, they're going to need some way to meter and bill for the system," he says. "IP Multicast remains to be proven as a viable product that service providers can feel comfortable offering across the board to their customers."

Solutions to the payment question will emerge over time, says Judy Estrin, president of Precept Software, Inc., of Palo Alto, Calif., which sells IP Multicast-based video software and counts Federal Express Corp. among its corporate customers.

"You'll see different ISPs providing different business models, trying them, and then [the services will] evolve," she says. "Some of the smaller ISPs may be able to just turn it on. Some of the large ISPs may have to put in closed groups, such as UUNET's UUCast."

Banking on Multicast

Financial institutions in particular have been aggressively rolling out IP Multicast services to corporate desktops.

Nearly two years ago, BankBoston hooked up the computers on its financial trading floor to IP Multicast. Earlier this year, Smith Barney, Inc. and Europe's Banque Paribas announced deals with software vendor Starlight Networks, Inc., of Mountain View, Calif., to deliver IP Multicast to traders and managers.

"Traders and dealers need real-time information," says Tanya Candia, marketing vice president for Starlight. "It doesn't help if the information is an hour or day late. They've got to have it as it happens."

For example, Banque Paribas is transmitting nine channels of live video to desktops in its London trading office and plans to increase that number over time, she says.

While video is the most popular use of IP Multicast, Milne predicts that file transfer soon will emerge as a major use of the technology.

The reason is "the vast majority of information we consume is not in real time, and that holds true in corporations," says Stephen Collins, marketing vice president of IP Multicast vendor Starburst Communications Corp., of Concord, Mass.

Combating network concerns

Meanwhile, IPMI continues to grow and push its agenda.

Membership has doubled to 80 since the January summit. Along with numerous small IP Multicast vendors, IPMI includes industry giants such as Microsoft Corp., Cisco Systems, Inc., Intel Corp. and IBM, as well as a host of ISPs, cable and satellite companies and broadband vendors such as MediaOne, Inc.

IPMI's major goal in its first year has been to educate the market about IP Multicast's uses and benefits, Hall says. As its second year begins, the group will focus on lobbying ISPs and carriers to deploy the technology.

The group also needs to overcome customer concerns. Results of an IPMI survey this summer of more than 100 IT managers showed that nearly 60% of respondents cited concerns about the impact IP Multicast would have on their networks.

To combat reluctance by network managers to implement IP Multicast, IPMI members collaborated to create the Internet Multicast Channel (IMC), which was unveiled less than two weeks ago.

The IMC features scheduled transmission of multimedia fare such as audio, video, software and graphics. The channel is designed to demonstrate the benefits of IP Multicast products and services and facilitate multicast peering agreements between ISPs, Hall says.

In addition, IPMI is sponsoring a series of educational seminars around the U.S. during the next two months.

"We'll focus on what network managers and MIS folks need to understand and the steps they should take to deploy IP Multicast within their networks," Hall says. ■

ROAD TO WIDESPREAD DEPLOYMENT

A sampling of this year's events that have furthered the IP Multicast cause:

January. First IP Multicast Summit, sponsored by IP Multicast Initiative (IPMI), held in San Jose, Calif.

February. Securities industry giant Smith Barney announces deal with Starlight Networks to deliver IP Multicast to 11,000 corporate desktops.

March. Microsoft, Cisco and Intel announce a pact to boost multimedia applications over the Internet, including support for IP Multicast.

1997

May. IPMI showcases multivendor demo of IP Multicast at Networld+Interop in Las Vegas; Novell announces support of IP multicast.

September. UUNET, GTE Internetworking and several other large Internet service providers announce availability of IP Multicast service to customers.

October. IPMI members launch Internet multicast channel.

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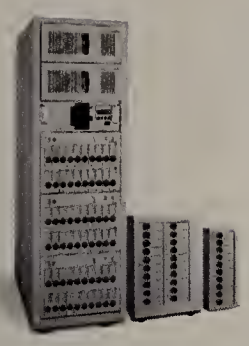

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Capitalizing on Internet Technologies

October 1997

IntraNet

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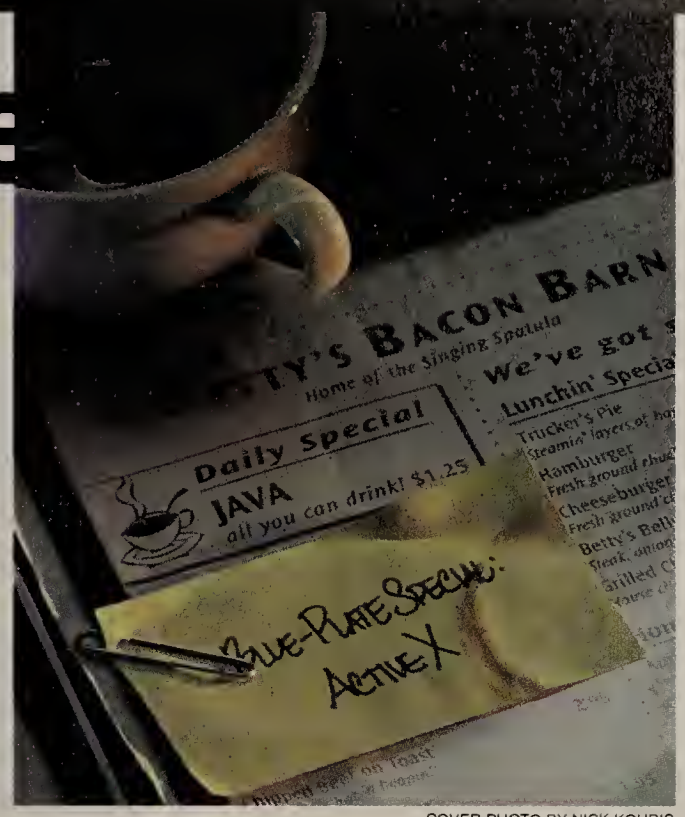
INSIDE

IntraNet

October 1997
Volume 2, Number 10



COVER PHOTO BY NICK KOUDIS

FEATURES

DEPARTMENTS

From the Editor

I had an awakening the other day while talking with an intranet manager. It wasn't a metaphysical experience, or anything, but it still woke me up.

This intranet manager and I were wrapping up our conversation when he tells me if I'm going to publish anything, I have to notify his company's PR department. That's never quite what a journalist likes to hear. But given that I was talking to a user, not a vendor, I decided to cut the guy some slack and agreed.

So, reaching for an inch-thick paper phone book sitting on his windowsill, the intranet manager says, "Let me get you the name and number."

Now never mind that this IT manager had just spent the better part of an afternoon showing me his company's internal Web and still had the home page displayed. And forget the fact that we had spent a good number of minutes talking about the first application, a company phone directory, to be created for the intranet.

And so it dawned on me. There are instances that an intranet, no matter how content rich, will face a tough time beating down old habits. As long as companies don't scuttle paper documents in favor of Web-only presentations, they'll run the risk of some employees favoring the older and, in some cases, outdated, information resources.

In this case, the intranet manager quickly realized the faux pas and chucked the directory into the waste basket. But I still wonder: Was that the end to his waywardness, or did that phone book end up back on the windowsill?

— *Beth Schultz,* executive editor
(bschultz@nww.com)

IntraNet is a supplement to *Network World* published by International Data Group of Boston. *Network World,* 161 Worcester Road, Framingham, MA 01701. Phone: (508) 875-6400, Fax: (508) 820-3467, E-mail: nwnews@nww.com.

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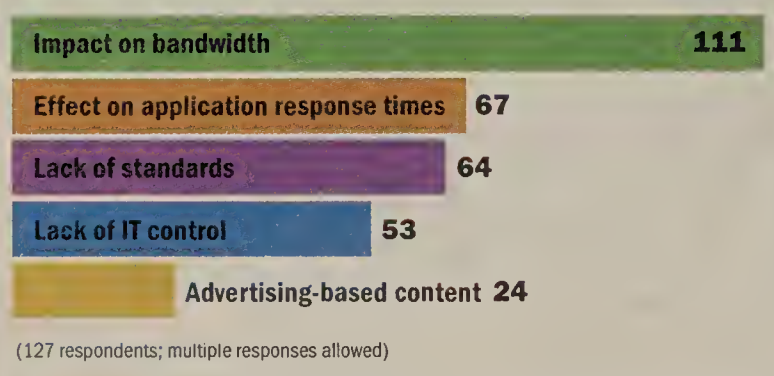
Thinking on internet technologies

Zona Research, Inc., of Redwood City, Calif., recently polled strategic-level MIS professionals who attended its annual fall conference on their current and planned use of Internet technologies. "Push" technology, application development, electronic commerce and intranet support were among the topics.

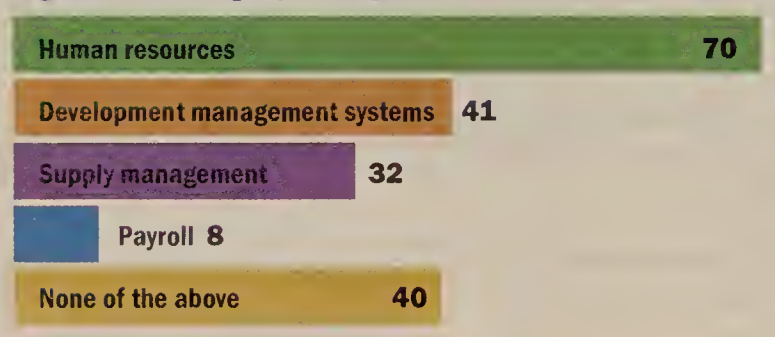
Examples of specific questions and results:

What do you believe are the major issues regarding the use of push technologies?



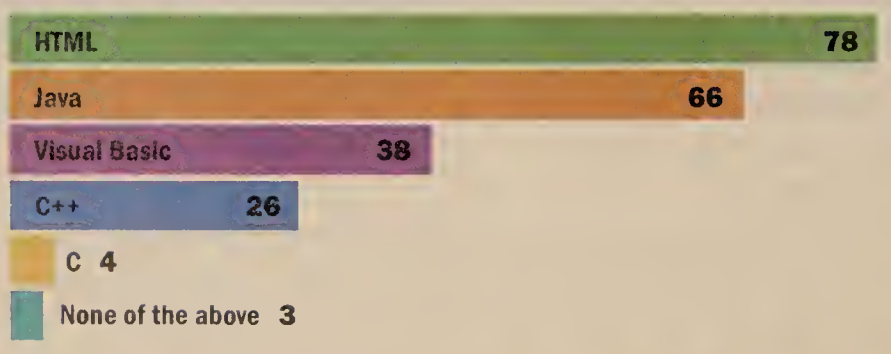
(127 respondents; multiple responses allowed)

Within the next 12 months, what applications will your organization deploy using Internet and intranet technologies?



(132 respondents; multiple responses allowed)

Which programming languages are you planning to use for developing these Internet/intranet applications?



(92 respondents; multiple responses allowed)

Keeping up with software

Check this guide to Web server releases to see if you've got the latest and greatest running on your intranet.

Vendor	URL (HTTP://)	Product	Release
Apache Project	www.apache.org/	Apache	1.2B8
Cisco Systems, Inc.	www.cisco.com/microweb/	Micro Webserver	1.0
Compact Devices, Inc.	www.devices.com	Twister	–
IBM	www.ics.raleigh.ibm.com/	Internet Connection Server	4.1
Microsoft Corp.	www.microsoft.com/infoserv	Internet Information Server Internet Connection Secure Server	4.0B2 4.1
National Center for Supercomputing Applications	hoohoo.ncsa.uiuc.edu/	NCSA HTTPd	1.5.2
Netscape	home.netscape.com/	Enterprise Server FastTrack Server	3.0 3.0
Novell, Inc.	www.novell.com/	NetWare Web Server	3.1
Microtest, Inc.	www.microtest.com/	WebZerver	1.0
Open Market, Inc.	www.openmarket.com/	Secure WebServer	2.0
Webtronics, Inc.	www.wtnx.com	WebBox	–
World Wide Web Consortium	www.w3.org/hypertext/WWW/Daemon/	CERN httpd	3.0A

Fodder for intranets

Part of the draw for intranets is easy access to information, whether directly related to the business at hand or just generally helpful. Here are a couple of resources that make good stock for intranets.

- **Online Health**

This health resource, updated monthly, is compiled by Rodale Health Promotions, an Emmaus, Pa., division of Rodale Press, which publishes healthy living magazines such as *Prevention* and *Men's Health*.

Online Health is divided into four sections: The Library, a catalog of more than 400 health topics; Briefs, short digests of more than 100 health, fitness and lifestyle research studies; The Newsstand, six interactive newsletters covering health issues; and The Quick and Healthy Kitchen, a compilation of low-fat recipes.

Online Health works on any PC or Macintosh with 8M bytes of RAM. Users need Netscape Communications Corp. Navigator 2.0 or Microsoft Corp. Internet Explorer 3.0 or higher browsers.

Users can see a demo of this health resource at www.rodaleonlinehealth.com.

- **Merriam-Webster's Collegiate Dictionary & Thesaurus, Network Edition**

Merriam-Webster, Inc., of Springfield, Mass., provides HTML versions of its *Collegiate Dictionary* and *Collegiate Thesaurus* for posting on corporate Webs. Users have a number of ways to find what they're looking for, including searching by parts of speech, definitions and dates, or for words that rhyme, biographical and geographical terms, foreign words and phrases, and abbreviations, for example.

The HTML program is available for Unix and Windows NT servers and myriad client types running most popular browsers. The Unix version requires use of SunSoft, Inc.'s Solaris 2.5 or higher operating system.

Pricing is based on the number of authorized users, with licenses for more than 500 users available on a contract basis.

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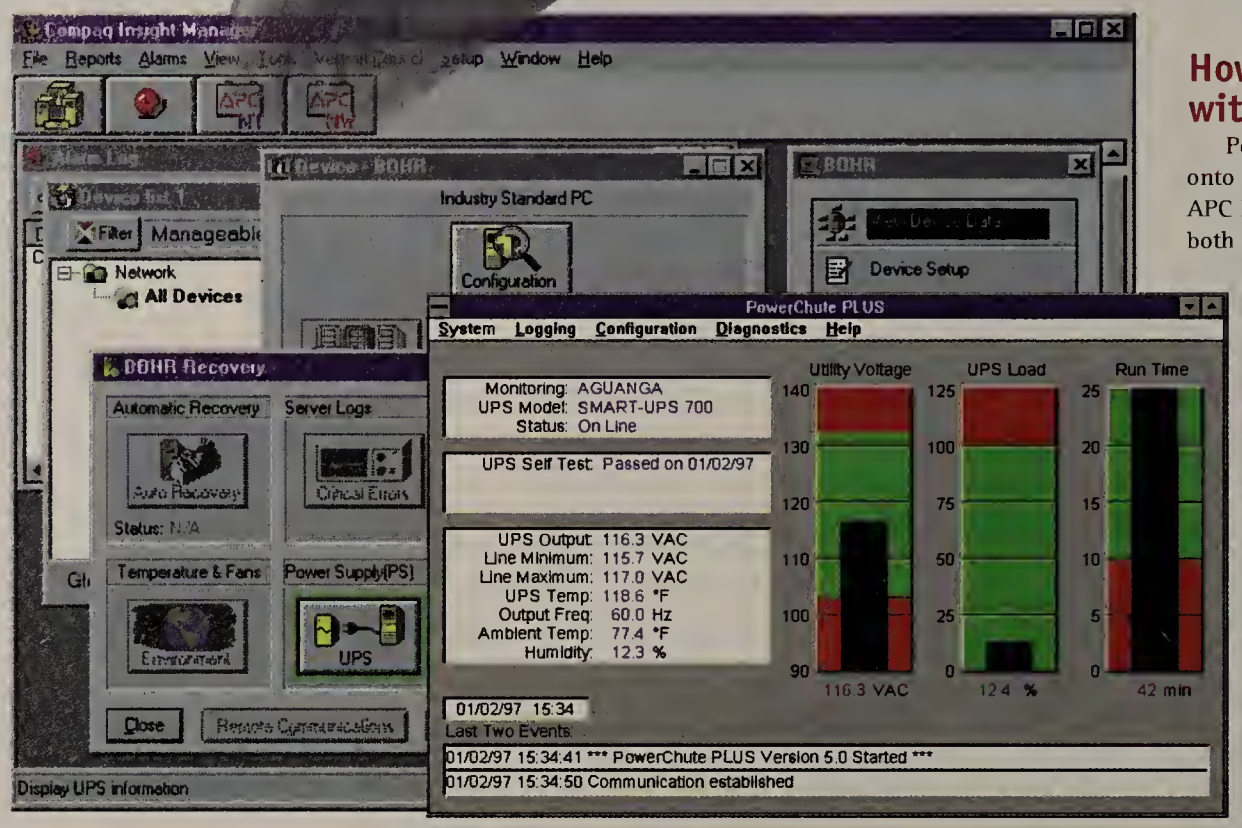
PowerXtend for CIM, one of APC's custom power management plug-ins for server management platforms like Compaq Insight Manager, IBM Netfinity, Intel LANDesk Server Manager, and HP NetServer Assistant means your network reliability extends beyond the boundaries of your OS, Hardware, and, most importantly, your management platform.



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Fully Configured Alert Response Application	✔
Launches directly from CIM *Quick occess during emergencies*	✔
Backwards compatible UPS software *APC softwore upgrodes do not require o UPS upgrade*	✔
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REVIEW

Wilson WindowWare's WebBatch:

Makes scripting for Windows-based Web servers a breeze.

BY MARK GIBBS

What do you do when you've got Web server back-end programs to churn out but no one familiar enough with a programming language such as C++, which would be overkill anyway, or a simpler scripting language like Perl?

Wilson WindowWare, Inc. has an answer: WebBatch, a scripting language for Windows 95- and Windows NT-based Web servers. With WebBatch, you can prototype in a fraction of the time of many other languages.

WebBatch is a derivative of Wilson WindowWare's well-known, 10-year-old WinBatch automation utility for Windows. WinBatch provides the simplicity and usefulness of good old DOS batch file programming under Windows. WebBatch comprises a subset of the WinBatch commands and some Web-related functions.

The WinBatch commands, called the Windows Interface Language (WIL), consist of 24 groups that total more than 500 functions. The groups include Dynamic Data Exchange, Dynamic Link Libraries (DLL), OLE, program and window management, and network. WIL, together with the usual control structures and simple variable types, provides a complete programming environment.

The WebBatch subset excludes the functions that deal with user input via the keyboard and mouse, the clipboard, window control and multimedia use — 45 commands in all. The additions include 15 functions specifically for the Web application environment.

Go online for a brief comparison of scripting and compiled languages.

www.nwfusion.com

These extra functions cover input and output for Web applications, including decoding the data from forms and translating it into variables, as well as accessing the Web server environment variables and writing to the WebBatch error log. They also include diagnostics, such as printing the WebBatch error log, and echoing the input data to a browser.

Installing WebBatch is trivially easy. Wilson WindowWare provides so-so documentation on WebBatch's use with Web servers from Netscape Communications Corp., O'Reilly & Associates, Inc. and Process Software Corp., but the product can be used with any Web server that supports Common Gateway Interface or Win-CGI.

PRODUCT CAPSULE

Name:	WebBatch
Current release:	97C
Price:	$295, including WinBatch
Requirements:	Windows 95 or Windows NT 3.51 or higher, 3.5M bytes of disk space and any Web server that supports CGI or Win-CGI
Vendor:	Wilson WindowWare, Inc., Seattle
Contact information:	Phone: (800) 762-8383 URL: www.windowware.com

Building batches

As its name implies, the WebBatch language is like a batch file, which is a plain text file that contains a list of commands to be executed. The simplicity of batch files means that automating the copying or deletion of files or any of a hundred other routine operations can be done quickly and easily.

Writing a WebBatch program is simple, in part because WebBatch hides the details of the interface between the Web server and script.

For example, routines such as WebCmdData — one of the added Web-related functions — provide access to the command line arguments passed in a URL, while parse-data — one of the original WinBatch commands — takes the arguments and moves them in sequence to an array. Compared with other application development systems, this is a simple way to get arguments.

WebBatch has great potential for providing a quick way to integrate Windows applications with Web browsers. For example, you could pass data and commands to an Excel spreadsheet from a WebBatch program. The spreadsheet could then process the data supplied by a form and send the results of the calculations back to the browser.

Here's the obligatory first program written with this scripting language:

```
; helloworld.web
; our first WebBatch program

webout("Content-type: text/html",2)
webout("<html>",1)
webout("<head>",1)
webout("<title>Hello, world!</title>",1)
webout("</head>",1)
webout("<body>",1)
webout("Hello, world!",1)
webout("</body>",1)
webout("</html>",1)
```

This will create a Web page saying, "Hello, world!," and send it to a browser when the program is called.

One of the neat WIL features is the ability to add DLLs of additional functions called Language Extenders. For WebBatch, Wilson WindowWare provides Internet Extender, which contains functions for communications between computers, access to Internet service providers and support for TCP/IP. These functions cover application-level services — File Transfer Protocol, HTTP, Simple Mail Transfer Protocol (SMTP), Post Office Protocol 3 (POP3) and ping — as well as low-level access to direct WinSock calls and support for controlling dial-up networking.

The HTTP functions allow retrieval of files from Web servers and support Basic Authentication firewall access, and URL encoding and decoding services. Combine these with the SMTP and POP3 functions and you can send and receive e-mail messages and create sophisticated form-handling scripts.

Finally, the direct access to WinSock calls allows you to implement a complete server for any TCP/IP protocol.

Batch basics

WebBatch's performance is good. However, under significant loading — for example, on a 166MHz Pentium with 10 or more users invoking WebBatch scripts simultaneously — you'll notice the penalty of the product's architecture — the use of CGI and an interpreted language.

Nonetheless, I really like Wilson WindowWare's latest product. WebBatch is simple to use, has a rich set of functions for providing powerful programming features and is robust. For its functionality and price, WebBatch is a steal.

PROS AND CONS Wilson WindowWare's WebBatch

Pros	Cons
▶ Simple to install and use	▶ Poor documentation
▶ Great for prototyping	▶ Performance limitations
▶ Excellent feature set	

SUMMARY: Wilson WindowWare's WebBatch is a terrific prototyping tool as well as a good platform for building Web server back-end applications for Windows 95 and NT servers. I highly recommend it.

RATING

Value for money	4
Intranet usefulness	5
Quality	3
Overall	4

1 is poor and 5 is excellent.

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Layers à la Netscape

This new Navigator 4.0 feature pumps up page presentation.

BY MARK GIBBS

Standards evangelists might berate Netscape Communications Corp. for making a new, nonstandard HTML feature called layers available in Navigator 4.0, but the browser feature can be useful in crafting a more exciting, powerful intranet.

To see layers in use, download the latest version of Navigator and access Netscape's home page at home. netscape.com. Netscape uses layers here to create three panels, each with its own behavior, that float on top of the main window. Other browsers will ignore the coding so users won't see the panels.

Are intranet managers keeping company Webs really open, or are they buying into proprietary technology such as Netscape's layers? See story, page 14.

On the Netscape page, the first panel sports a drop-down, expandable list of topics for navigating through the site, the second panel offers news-type data and a third panel features advertisements. Each panel has a tab, which, when clicked on, scoots the panel off the screen. Only the tag remains visible.

Layers à la Netscape involves a new HTML tag — <layer>. On a bandwidth-rich intranet, the tag can be used to create documents with huge amounts of data embedded or complex graphical site navigation maps that act as sliding panels. But the layers capability that gets most Web designers excited is the ability to assign *exact positioning* of document contents.

A Web designer could use the code:

```
<layer left="50" top="50">
Hello, layer 1.
</layer>
```

to create a layer that places the top left-hand pixel of the word "Hello" in the document window at 50 pixels from the top edge and the left-hand side. Or, the designer could define the left and top attributes as percentages of the window width and height.

So, if the browser window is 500 pixels wide and 250 pixels deep, the code:

```
<layer left="10%" top="20%">
Hello, layer 1.
</layer>
```

will place the frame 50 pixels from the top and left-hand side of the document window.

Web designers also can define multiple layers that overlap, as in:

```
<layer left="50" top="50">
Hello, layer 1.
</layer>
<layer left="50" top="50">
And Hello again.
</layer>
```

This particular example will produce an unreadable mess because the text in the second layer will be placed on top of the text in the first layer. But say I want to place a block of text on top of an illustration. All I'd need to do is create a layer with the graphic image and another layer with the text. The same technique can be applied for placing images on top of another.

Layer attributes

Layers also can be named, as in: <layer name="main" left="50" top="50">. Naming is required for controlling the order of layers. You achieve this "z-axis" ordering through parameters in the layer tag.

The "z-index" parameter sets the position of the layer exactly, while "above" and "below" allow you to specify the order of layers relative to each other. So, the code:

```
<layer name="B" left="50" top="50"><img
src="image1.gif"></layer>
<layer name="C" left="30" top="30"><img
src="image2.gif"></layer>
<layer name="D" above="B" left="10"
top="10"><img src="image3.gif"></layer>
<layer name="E" below="B" left="40"
top="40"><img src="image4.gif"></layer>
<layer name="A" z-index="1" left="20"
top="20"><img src="image5.gif"></layer>
```

creates layers stacked from top to bottom in the order A, E, B, D, C. Since each layer contains an image, this code creates a precision graphic layout.

Another parameter, "visibility," allows you to hide or show the layer or have a child layer inherit the same visibility as its parent.

Setting the width of layers causes text to wrap within the horizontal limits of the layer. In addition, you can set the layer's height and define the content source, the background color, background image and how the layer is clipped.

Layers get really interesting when combined with JavaScript. In fact, this is what makes the Netscape home page panels behave as they do.

ASK DR. INTRANET

Please step in and lie down, Steve Blass is in for consultations. He understands the strains felt by people developing and managing intranets. Send your problems to dr.intranet@paranet.com.

The Web browsers bundled with our network computers (NC) don't have kiosk mode. How can we restrict these NCs to the intranet?

Via e-mail

Install a proxy server that only allows the NCs to connect to your intranet server. If you can use freeware, try Netcat. This freeware, available at www.cs.purdue.edu/coast/archive/, builds easily on all kinds of Unix and NT systems. It lets you determine allowable URLs, and its documentation outlines how to implement the proxy server for your requirements.

Alternatively, you can stop the traffic at the router if there's a clear boundary, use a second licensed copy of your current proxy server or run a fully functional browser in kiosk mode at the server and return the display to your thin clients. In any case, ask your NC vendor to fix the browser.

We use Hummingbird Communications, Ltd.'s NFS Maestro for Windows 95 and NT to access Unix file systems on our intranet. We need products that support Windows file and printer sharing from our Unix machines. What do you recommend?

Via e-mail

I recommend:

• Samba, a free Server Message Block (SMB) implementation available at lake.canberra.edu.au/pub/samba/. Samba, which allows a Unix machine to masquerade as an NT server, runs on many Unix platforms and even has support available.

• Sun's SMB server, the Solstice LM.

By providing SMB connectivity to the Unix machines, you eliminate the need to maintain PC Network File System (NFS) configurations.

However, the Windows machines can expose your Unix system passwords through a fairly well-known Windows password caching feature. For information about modifying Windows password caching behavior, go to www-leland.stanford.edu/~llurch/win95netbugs/.

SMB connectivity enables Unix systems to look and feel like Windows servers to Windows clients. You can access Windows network resources from these systems, resulting in one big, happy, interconnected intranet!

Blass is a network architect at Houston-based Sprint Paranet, a distributed computing systems services provider.

You can create a movie with variable frame rates by hiding and showing several layers containing static images in a sequence.

Animation can be achieved in conjunction with hiding and showing, moving or reclipping layers. You use the setTimeout() method.

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THE NETSCAPE LAYER TAG

As defined by Netscape Communications Corp., the <layer> tag consists of:

<layer [NAME=layerName] [LEFT=x] [TOP=y] [Z-INDEX=z|ABOVE=layerName|BELOW=layerName] [WIDTH=w] [HEIGHT=h] [CLIP=bounds] [VISIBILITY="SHOW"|"HIDE"|"INHERIT"] [BGCOLOR=rgb] [BACKGROUND=URL] [SRC=URL]>

where all terms in square brackets are optional and choices are separated by a vertical bar. Note that all string values should be enclosed by quotation marks — for example, ABOVE="homelayer".

Go online for the full documentation on Netscape's layers implementation and more examples.

FIND IT ON 4302 FUSION

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The parameters are as follows:

- **NAME: names the layer**
- **LEFT: defines the position of the layer in pixels or percentage of the window/parent layer**
- **TOP: defines the position of the layer in pixels or percentage of the window/parent layer**
- **Z-INDEX: specifies the exact ordering of the layers**
- **WIDTH: defines the width of the layer in pixels or percentage of the window/parent layer**
- **HEIGHT: defines the height of the layer in pixels or percentage of the window/parent layer**
- **CLIP: sets the clipping of the layer with the argument bounds being "x1_offset, y1_offset, x2_offset, y2_offset" (each value is the number of pixels or percentage of the window/parent layer)**
- **ABOVE and BELOW: sequence of layers relative to each other**
- **VISIBILITY: controls whether layers can be seen**
- **BGCOLOR: sets the layer's background color to the name of a standard color or a hexidecimal RGB value**
- **BACKGROUND: sets an image as the layer's background by its URL**
- **SRC: defines the content of a layer to be found at the given URL**

—Mark Gibbs

Clicking on the tab initiates JavaScript that sets the layer's top and left attributes so the layer slides out of sight, but leaves the tab visible.

Netscape's spin

Netscape's layers implementation in Navigator 4.0 predates availability of a formal layers specification from the World Wide Web Consortium (W3C). The W3C's layers specification is under development, but the group has not set finalization.

Microsoft Corp. also is moving toward layering. The company, however, is working through Cascading Style Sheets, a W3C standard. The layers functionality will be supported in the Internet Explorer browser.

So, before you move wholesale to adopting Netscape's layers, be warned: Chances are the layers specification will evolve.

However, I'd be surprised if the changes required to upgrade from one version of Netscape to the next will be really major.

If used judiciously now, layers could make your intranet more powerful.

Intranets in an instant

Four vendors offer small, simple and cheap Web server kits.

BY MARK GIBBS

Wouldn't it be great if intranet servers were really easy to use, set up and manage? And what if you could buy one of these devices today, for a pittance? You'd be happy, right?

Well, put on your dancing shoes, because you can pick among four products that meet these requirements. Cisco Systems, Inc., Compact Devices, Inc., Microtest, Inc. and Webtronics, Inc. have each released what amounts to a Web server in a box.

These "information appliances" for the intranet are small, simple and cheap, which makes them perfect for hosting workgroup and departmental intranet content. But there is a downside: Only one of the products provides the ability to run back-end scripts. Without this capability, you'll run into problems if you need to serve forms on the intranet.

"Zerving" the intranet

Microtest's history of providing information appliances dates back to 1989 with the release of the LANPort network printer. In September, it threw a Web server, called WebZerver, into the company's product mix.

WebZerver is a small box, measuring approximately 9 1/4 by 6 by 2 3/4 inches, powered by a 12V adapter. WebZerver's back panel sports only the power connector, a 10Base-T/100Base-TX port and a SCSI connector. The front panel has four lights — one each for status, network activity, network speed and drive activity — and a reset button.

Internally, WebZerver has an Advanced Micro Devices, Inc. 486 133MHz processor with 8M bytes of RAM and a 2.1G-byte disk drive. The SCSI port allows the attachment of up to seven devices, including disk drives, CD-ROMs, DVD drives, Magneto-optical, EZFlyer, SyJet, JAZ and ZIP drives. This allows for a wide range of storage options.

The device runs Linux, a Unix clone, and the Apache Web server software, both available in the public domain, as well as a File Transfer Protocol (FTP) server. Bundled with the system are a number of utilities, including EazyPrint, which provides a Windows driver so applications can print documents directly to Web server storage, EazySite, for controlling content style, and an FTP client.

WebZerver also supports conferencing, so users can exchange and review comments. It also provides the standard Web server Basic Auth-entication that allows access control by user name and password.

Configuration and management is done through a Web interface and, if your network is already running Dynamic Host Configuration Protocol (DHCP), the WebZerver will autoconfigure its address accordingly. Installation, including time for reading the manual, takes 20 minutes at most.

A compact device

Compact Devices because the main competitor in the Web appliance market when it launched Twister in May. From a more modest platform than WebZerver — an Intel Corp. 80186 running at 40MHz with 1M byte of RAM — Twister provides excellent performance using its own operating system and server software.

Among the services the device can deliver are HTTP, FTP, Trivial FTP, which is a simpler version of FTP, and telnet, for remote console access to the system for configuration.

Like WebZerver, Twister is small — approximately 8 by 7 by 2 1/4 inches. It has a 1.2G-byte internal hard disk with expansion via a SCSI connector on the back panel. Expansion options allow for a single SCSI or ZIP drive and up to five CD-ROM drives.

The back panel also has a serial port for setup purposes if required (setup usually is done across the network using the device's Web-based management interface) and a network port for 10Base-T connections.

Twister can be automatically configured, and Compact Devices tops that capability with a neat feature for sites that don't use DHCP, BOOTP or Reverse Address Resolution Protocol to allocate IP addresses. The product includes a utility that emulates DHCP from a Windows 95 workstation for automatically assigning an IP address to a new unit.

Twister has a more complex options and management set than WebZerver and provides more flexibility. Compact Devices includes Net-It Software Corp.'s Net-It Now document-to-Web converter for Windows applications and Claris Corp.'s Home Page editing tool for Windows and the Macintosh.

The Twister Web server supports Basic Auth-entication and provides detailed configuration of user page content and styles.

"For IT departments that are short-handed, this box is truly plug and play," says Tony Bilyj, chief of network management for the Department of Veteran's Affairs (VA).

Bilyj installed Twister several months ago to serve 270 intranet users. He hasn't had to monkey around with the product since. "It's a pleasant change that we haven't had to touch the hardware," Bilyj says, adding that the VA may need to install more Twister servers if interest in the intranet continues growing.

Cisco also sees potential in this market. It offers Micro Webserver, which is Compact Devices' Twister technology on Cisco hardware. However, Cisco has stripped down Twister so the main storage is a 100M-byte ZIP drive, which gives somewhat lower performance, and bundles in different add-on utilities.

Out of the box

Webtronics WebBox is a new entrant in this arena. This product is based on a Motorola, Inc. MC68EN RISC processor running at 20MHz with 4M bytes of RAM.

WebBox is unique in that it is solid state: The storage is 512K bytes of read-only memory (ROM) and 4M bytes of flash ROM, expandable to 20M bytes, with no options for adding other storage devices. A plus for the WebBox is its support for scripting, although you'll need to be proficient in Tool Command Language, commonly known as Tcl.

INTRANET APPLIANCES

The following products allow intranet managers to get workgroup or departmental intranets up and running easily and inexpensively.

Vendor	Contact information	Product	Pricing
Cisco, San Jose, Calif.	(800) 553-6387; www.cisco.com	Micro Webserver	$830
Compact Devices, Campbell, Calif.	(800) 894-0519; www.devices.com	Twister	$1,095
Microtest, Phoenix, Ariz.	(800) 526-9675; www.microtest.com	WebZerver	$1,595
Webtronics, Inc. Laguna Hills, Calif.	(714) 582-1946; www.wtnx.com	WebBox	$1,299

In addition to their use as departmental Web servers, these devices can be located at Internet service provider sites

Webtronics is unique among its competitors in providing the ability to support scripting. To do so, it supports Tcl.

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Do standards HELP or HURT?

Proprietary functions can enliven an intranet but limit viewing. What's an intranet manager to do?

BY PEGGY WATT

IT managers are loathe to lose the advantages of open Web technology, but they're approaching a crossroads in intranet development: Do they take the reliable, but plain, standards path or specialized routes pocked with proprietary technology?

Intranet developers looking for more powerful page presentation capabilities, for example, often face that question. At issue now is whether they take advantage of the new layering function Netscape Communications Corp. released as part of its HTML implementation in Navigator 4.0 or wait until the World Wide Web Consortium (W3C) finishes work on its layers specification (see Handbook, page 10).

While some companies grapple with the intricacies of HTML, other companies say it's simply enough to use Web technology. To them, variations aren't an issue.

Such is the case at Knight Ridder Information, Inc. (KRI), of Mountain View, Calif. When KRI customers requested access to the company's databases through the Web, they did not specify browser preferences, says Marck Shipley, IT vice president.

More often than not, Webmasters who allow outsider access to the corporate Web resist implementing variations that exclude some browsers because a company can't control what software its partners or customers use. They might shy away from Netscape's layers technology, for example, because its use would be limited to only users with Navigator 4.0.

"Our extranet has to be as vanilla as possible to allow our customers and suppliers to get on the network," says Ken Ouchi, chief information officer at custom chip manufacturer Solectron Corp., of Milpitas, Calif.

Ouchi discourages use of proprietary HTML or other Web page design technology that isn't supported by the most popular browsers. At times, this policy has meant passing up an enticing, but proprietary, feature. Solectron opted to not use an ActiveX Control that Internet Explorer (IE) 4.0 sports for allowing nested searches through a hierarchical diagram of directories. He did so because users with Navigator 4.0 can't view this directory manager.

However, Ouchi took advantage of a Navigator-specific search-and-transfer function that was well-suited for helping customers identify certain information on Solectron's extranet. He added a third-party utility that converts the code so IE can view it, too.

"I don't like using the least common denominator, but at least sometimes I can splice in code to get around something proprietary," Ouchi says.

Forfeiting the greatest

Although an intranet manager might appear to have more control over browser use than a general Webmaster, the fact is it's easy for employees to get and install browsers. Sometimes, even internal Webs must support access by browsers representing a variety of technological sophistication. At the least, intranet managers need to make it clear to employees that if they don't use the IT-supported choice they might not see all the pages properly.

"We have to work with the lowest common denominator of code, which means we have to stick with standards," says Wayne Thayer, a business consultant who manages the intranet at Honeywell, Inc., of Phoenix. Honeywell supports a mix of Navigator and IE, so all page elements must be accessible by both browsers.

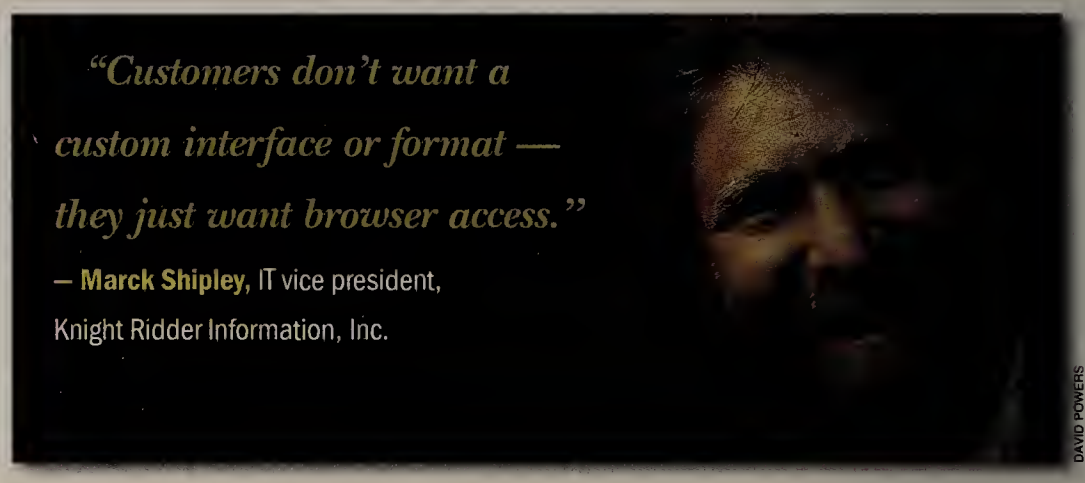
And homogeneity is relative. Microsoft and Netscape support Java scripting languages, but Thayer has found some inconsistencies and incompatibilities between their implementations.

Standards aren't really an issue on the server side, although choosing one operating system and program obviously makes maintenance easier for IT. Sticking with one or two server products isn't always practical, however.

For example, Thayer says, a department may want to integrate an existing Notes server or incorporate a local public-domain or personal Web server.

What's more, Web interfaces to established corporate databases may require particular functions. These then force standardization.

"A sophisticated transaction-processing application really needs specific capabilities by a browser to interface properly," says Mary Duffy, senior director of global human resources



DAVID POWERS

automation for Applied Materials, Inc., of Santa Clara, Calif. Real-time transaction processing makes the HR department's intranet useful, but the custom code that provides links to legacy data requires a standard interface.

"I can't say enough about the importance of following standards," says Steven Fraser, director of IS and telecommunications for International Shipholding Corp., of New Orleans. "Standardizing on one database or browser might not be easy, but if you set some goals, even to have conformity a few years off, you can whittle your selection to a couple of database interfaces."

Setting internal standards

Many intranet managers impose standards by the type of resources they give users. For example, IT may train Webmasters only on approved tools.

Several intranet managers say they encourage use of Navigator because Netscape updates it across operating systems more frequently and consistently than does Microsoft with IE.

At Xerox Corp., of Stamford, Conn., employees with Intel Corp.-based PCs have to use IE, and those with Unix workstations get Navigator. While important for business reasons, this can be technologically limiting, says David Woodruff, program manager of Internet services.

Xerox steers people away from any technology that can't be used on both computing platforms and with both browsers. For example, ActiveX Controls have virtually no chance of showing up on the Xerox-Wide Web.

These are proprietary Microsoft standards and, without support for the Unix platform, there'd be a portion of the Xerox community that would be excluded. "Java has certainly been much more of an open standard than ActiveX has been," Woodruff says.

Vendors with intranets of their own tend to practice what they preach, and often their sermon is open standards and interoperability. As a systems integrator, for example, Digital Equipment Corp. promotes openness. Most users browse with Navigator, but IE and even Mosaic also run on corporate clients.

"We don't do browser-sensing yet, but we produce four versions of every page: Java-enabled, Java with tables, text-only and non-table pages," says Kathleen Warner, vice president, Internet/ Intranet Deployment Office.

"Our internal users, like anyone's, shouldn't know whether the information is on an NT machine or a Unix machine, nor should they care. Their only issue is getting the information quickly and accurately," Warner says. And that remains the bottom line in any intranet standards question.

AN EYE ON TECHNOLOGY

Whether formalized by a standards body or accepted as de facto standards, the status of the following technologies are worth checking out before implementing on an intranet.

For browsers:

- ActiveX (including Active Server)
- Broadcast/subscribe technology (Microsoft's Channel Definition Format and Netscape's Java-based Netcaster)
- Cascading style sheets
- Dynamic HTML
- Java and Java scripting languages
- Layers

For mail systems:

- Internet Message Access Protocol
- Multi-purpose Internet Mail Extensions and Secure/MIME
- Simple Mail Transfer Protocol

Others:

- Fast CGI
- HTTP
- ISAPI and NSAPI (Microsoft and Netscape server APIs, respectively)
- Secure Sockets Layer

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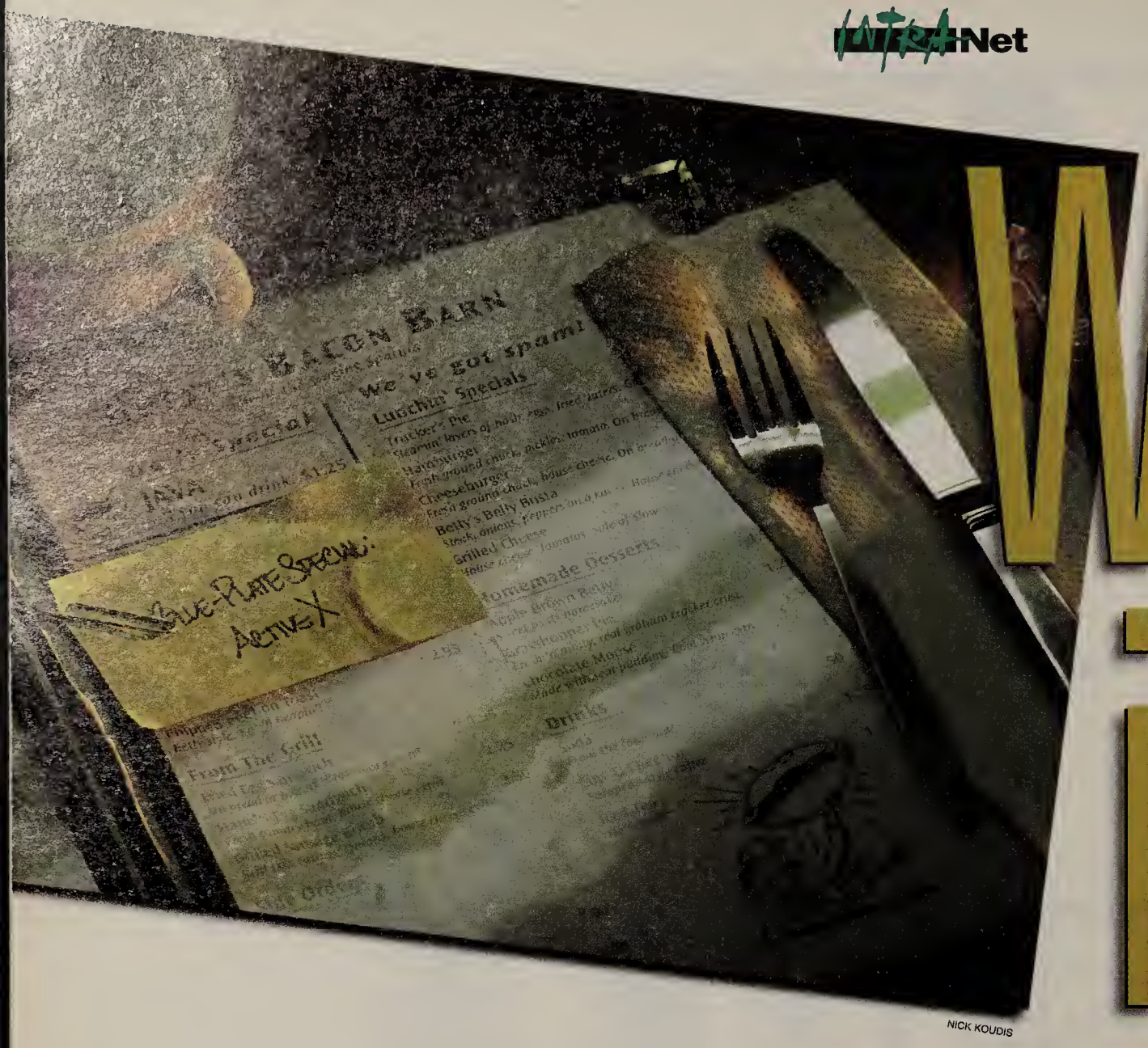


NICK KOUDIS

What'll it be?

Picking between the Java and ActiveX application development environments might seem as easy as placing an order for a Lunchin' Special, but some of what you get may be hard to swallow.

BY ELISABETH HORWITT

When HealthData Resources, Inc. (HDR) went shopping for an intranet application development platform, it found at least one compelling reason to choose Sun Microsystems, Inc.'s Java over Microsoft Corp.'s ActiveX.

Programmers already were writing code in C and C++, so HDR's IT department reasoned they'd be able to pick up the C++-based Java in a snap. That was a big consideration, but it couldn't top other factors weighing in in ActiveX's favor.

For one, while C++ would work out fine for programmers, it'd be a giant step for the medical center and hospital IT people who would be building intranet applications to access HDR systems. The average IT person would find it much easier to work with ActiveX Controls — the equivalent of Java applets — because they can be built in a variety of languages, including the simple Visual Basic, says Ed Risinger, product manager for HDR, a medical systems company in Austin, Texas.

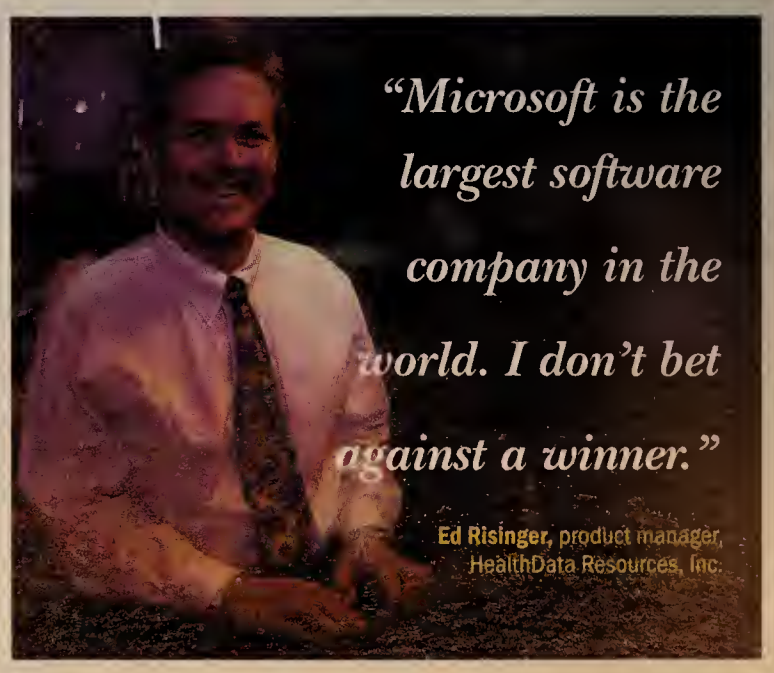
HDR also had a problem with Java's "sandbox" security model, which prevents downloaded applets from accessing the files and peripherals of the system they run on. The problem relates to the company's use of smart cards that collect medical demographics, such as administrative insurance information, and do target-illness tracking for statistics on incidence of HIV, cardiovascular disease or tuberculosis in a medical institution, for example.

"You cannot gain access to a smart card reader or writer with Java," Risinger says. And then there is the reason Risinger hates to admit: market dominance. "Microsoft is the largest software company in the world. I don't bet against a winner," he says.

Indeed, HDR has pretty much standardized on Windows 95, so even Java's vaunted client independence is unnecessary, Risinger says.

HDR is far from alone in pitting the two environments against each other. As more and more companies move beyond simple HTML pages and Common Gateway Interface scripts to more interactive intranet applications, IT managers are painstakingly weighing the trade-offs of going with either Sun's or Microsoft's Web application development architecture.

Although they often are represented as arch rivals, Java and ActiveX products actually address



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different pieces of the intranet puzzle.

What's the difference?

Java is an object-oriented programming language for creating applets that can be downloaded from a Web server and run on a Web browser. Virtual machines interpret Java byte code so it can run on most clients.

ActiveX is an intranet-compliant version of Microsoft's OLE protocol, which defines how applications can interact and exchange information in a Windows or Windows NT environment. ActiveX extensions make it possible for OLE-compliant application components — ActiveX Controls — to interact within an intranet client/server environment.

So intranet developers really aren't comparing Java and ActiveX — or even Java applets and ActiveX Controls. Rather, they're evaluating the full architectures that Sun, Microsoft and their respective partners have built around these products (see graphic, page 22).

Few IT managers harbor illusions that either Java or ActiveX will be a panacea — at least at this early stage of these platforms' and intranets' life cycles. Instead, they adopt this basic four-step strategy: prioritize intranet application needs; evaluate products carefully; choose the product that meets the most-critical needs; and either work around or put up with the inevitable trade-offs (and hope the vendor will fix them soon).

Strategic Technology Resources, an intranet systems integrator based in Chicago, has helped many companies go through that process. Java and ActiveX each have promise, depending on what your needs, says J. Lawrence Podmolik, director of technology.

ActiveX, with elements such as OLE and Visual Basic, is more mature than Java, so more tools are available. However, Sun and its partners are quickly filling in the missing pieces for Java. This, plus its cross-client portability, makes Java a no-brainer for companies with a mixed client environment, Podmolik notes.

Java's good, but not great

However, even IT managers for whom the Java choice is obvious admit the product has drawbacks.

Munich Reinsurance Company of Canada, for example, needed only a brief look at ActiveX before discounting it. "ActiveX couldn't deliver any-

WHY NOT BOTH?

When it comes to ActiveX and Java, intranet managers don't necessarily have to make an either-or decision.

It is technically possible to integrate the two intranet application development environments, but the brave souls who undertake such a project will have their work cut out for them.

A company could run Java applets in the ActiveX environment, for example, but it would need to build wraparounds or bridges. And that's not an easy task, says J. Lawrence Podmolik, director of technology for Strategic Technology Resources, a Chicago-based consulting firm.

While many users are leery of tackling the integration issue now, they realize it looms in the future.

"Interoperability between Java and ActiveX applications is a concern, particularly if we get into extranets for joint ventures [that would involve both platforms]," says Ioannis Charalambous, practice manager for Shell Services Co., of Houston.

The problem is likely to get much more complex as companies begin setting up distributed component-based architectures running on Microsoft Corp.'s Distributed Component Object Model (DCOM), SunSoft, Inc.'s Remote Method Invocation (RMI) and the Object Management Group's Common Object Request Broker Architecture (CORBA).

Microsoft's stance is straightforward enough: Use DCOM. Java clients and servers can currently interoperate over DCOM, and "any Java object on the client side or the server side can interoperate with any DCOM object on the client side or server side," a Microsoft spokesman says.

Microsoft has no plans to support CORBA, the spokesman says. Nor has it announced any plans to support Internet Inter-ORB Protocol (IIOP), a CORBA specification for interconnecting application components over the wire.

Sun's position is a bit more complex. While the vendor recommends RMI for interconnecting Java applets, it bowed to user pressure in June and announced plans to implement IIOP support in RMI. It did not, however, release an availability date.

This support will allow Java applets to invoke CORBA objects through IIOP, Sun says. However, it requires using JDK 1.2 as well, which some intranet programmers may find cumbersome.

— *Elisabeth Horwitt*

thing that we couldn't get with Java and couldn't guarantee client portability," says Joe Golobic, assistant vice president of IS at the Toronto-based division of Munich Reinsurance, a German company.

As part of Munich Reinsurance's intranet-based data warehouse, 4,500 users of Windows PCs and Macintoshes worldwide will get access to customer information via Java applets delivered through their browsers. Despite IT's certainty that it picked the right application platform, Java has proved cumbersome for Munich Reinsurance programmers trying to code certain functions, particularly graphical elements on intranet pages, Golobic says.

The company was able to address the coding problem through a third-party product, Progress Software Corp.'s Apptivity. The point-and-click graphical development environment available in Apptivity takes most of the grunt work out of Java programming tasks, such as painting screens and hooking up the client to a database back end, Golobic says.

For example, it took company programmers only months to build the first application using Apptivity. With Java alone, it would have taken about two years, Golobic estimates.

ActiveX attributes

The easy decision in favor of ActiveX comes to those companies that already have invested heavily in Microsoft client/server systems and tools.

When Merrill Lynch & Co. of New York decided to standardize on an intranet application platform, for example, the company was a couple of years into the implementation of a corporatewide desktop operating environment based on Microsoft's Windows, OLE and Distributed Component Object Model. That means the firm already had a lot of custom controls and code and expertise invested in Microsoft's desktop application environment, says Paul Kanevsky, director of software development.

For Merrill Lynch, ActiveX provided a relatively smooth migration for its desktop environment from straight OLE to an intranet. The company is developing a system it calls Trusted Global Advisor, which will allow 25,000 Merrill Lynch users to access key customer information via approximately 25 applications.

Some of the Trusted Global Advisor applications are intranet-based, others are client/server, some are internally developed and some are local to the desktop PC, Kanevsky says.

Through OLE and ActiveX, all of these applications are integrated within a single browser and the Windows NT desktop environment.

That consistency of desktop system configuration is crucial to the intranet model of application management, in which client software is partially or wholly maintained on the server and new updates are automatically downloaded the next time a client logs on. That model has saved application managers at Merrill Lynch and HDR a lot of work. It's much simpler than regular client/server models, Kanevsky says.

HDR actually had been putting off migrating large chunks of an application from DOS to Windows in order to avoid having to "fiddle with thousands of desktops every time Microsoft releases yet another Windows update," Risinger says. With centralized, automatic updates made possible by ActiveX, IT finally can migrate those remaining pieces to Windows.

A little of both?

Sometimes it makes sense to use Java and ActiveX, particularly if you happen to be a Fortune 500 company with diverse user populations, computer configurations and application

development projects.

Such is the case with Shell Services Co., a Shell Oil Co. subsidiary in Houston that provides IT and other types of services to various Shell entities. The organization has found Java to be the best choice for groups using Unix and Netscape Communications Corp.'s browsers, but if a client has Microsoft's Internet Explorer and wants browser access to Excel or other Office applications, ActiveX is the way to go, says Ioannis Charalambous, practice manager for Shell Services Co.

"With ActiveX, you can access existing applications via a Control, instead of having to write them from scratch as you have to with Java," says Charalambous, adding that that's a big plus.

And it's even so at Merrill Lynch, despite the fact that it's a basic NT shop. "With SQL databases, [ActiveX] is no problem. But there are data sources out there we have to talk to and nonstandard internal [database] applications that ActiveX does not talk to very well and that Java applets can access," says Edward Simmons, a vice president at Merrill Lynch.

One advantage to moving to Java is the intranet language's garbage collection feature, which automatically deallocates memory once an operation is over — something C++ doesn't provide. "That's a key feature with multithreaded applications," Simmons says.

On the other hand, he adds, with Java you lose some C++ capabilities, primarily the ability to make direct operating system calls. "You can use Java as a language to write a compiler [that makes direct calls], but then you lose the sandbox security and the ability to write once, run anywhere."

Of course, not all users consider Java's sandbox a desirable feature — witness the case of HDR.

Indeed, one of the big issues dividing users into Java and ActiveX camps is the different methods the two use to keep downloaded application components from doing what they shouldn't: accessing private files, planting a virus or trashing a disk, for example.

Java keeps applets in a sandbox, or secured area of the client, period. By doing so, it prohibits them access to files or peripherals.

ActiveX Controls, in contrast, can access any part of a system a regular application can, once they are downloaded. Microsoft uses the trusted security method of issuing certificates to the effect that anything downloaded from a particular third-party server is harmless. This scheme fits well with HDR's security needs. As mentioned above, the company sells medical smart cards that Java applets can't access from the sandbox.

But the ActiveX security system can break down when users download Controls from the World Wide Web, particularly from unknown or otherwise dubious sources, Risinger says. That's one of the reasons HDR certifies the smart card development tools it makes available to the general public via the Internet, he adds.

Munich Reinsurance, on the other hand, prefers Java's more stringent sandbox security. "I would rather people didn't mess with peripherals or files [via applets]," Golobic says. "If they need to, there are always ways to give them limited access."

Users also tend to fall into opposing camps on the performance issue.

As an interpreted language running on a virtual machine, Java's performance on a client system has suffered unfavorable comparisons with compiled ActiveX Controls. On the other hand, Java applets are compact so they download fast, Risinger points out, adding that downloading ActiveX Controls "takes forever."

However, notes Merrill Lynch's Simmons, once you download an ActiveX Control it stays on the client, whereas all the pieces of a Java applet need to be downloaded each time. This can be a real performance problem when the user has loaded all sorts of widgets onto Java.

THE BITS AND PIECES

When comparing the Java and ActiveX application development platforms, intranet managers need to look at all the various elements of the respective architectures.

Component	Microsoft's ActiveX	Sun's Java
Development language	Any language, such as Visual Basic, Java, C, that has hooks to OLE	Java
Definitions/APIs for hooking objects together	ActiveX/OLE	JavaBeans
Definitions for how objects interact across networked systems	DCOM	RMI
Client platforms	Windows 95, NT	All leading operating systems
HTML scripting language	Visual Basic Script	JavaScript

Just give them time

While the current Java- and ActiveX-based intranet architectures may have their downsides, IT managers are hopeful about recent and promised enhancements and fixes from the principal vendors and their third-party partners. For example:

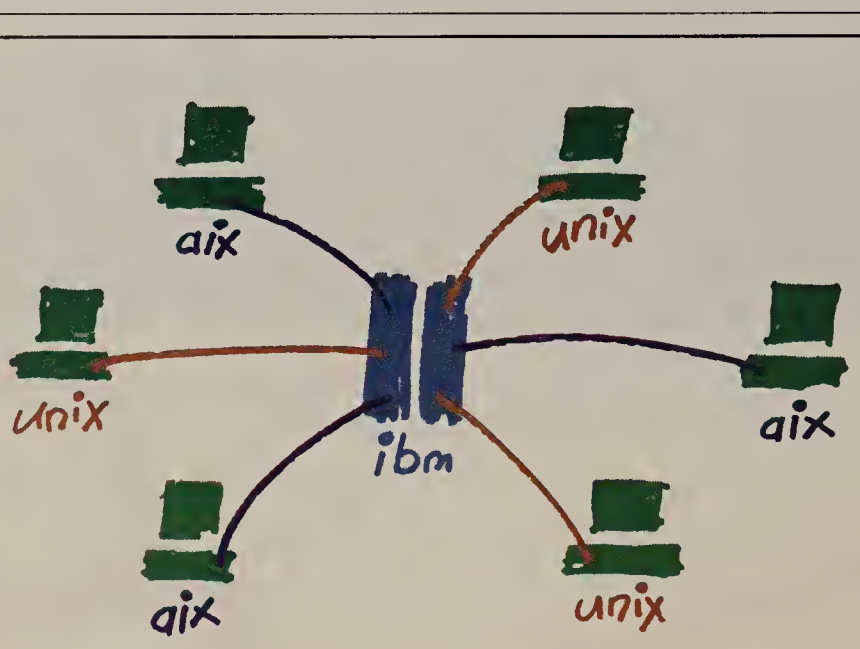
- JavaBeans, applet components that are part of the recently released Java Development Kit (JDK) 1.1, are said to have persistence.
- Platform vendors such as Microsoft, Sun and Hewlett-Packard Co. are developing just-in-time (JIT) compilers to translate performance-critical Java program sections into machine code for run-time, Sun says.

For example, Sun subsidiary SunSoft, Inc. is developing a JIT compiler for its Solaris operating system that will enable run-time Java applets to execute up to 50 times faster than regular Java applets.

- Sun and Microsoft recently introduced digital signature technology that enables browser users to look up a digital certificate. The certificate authenticates that a given component has been signed by an authorized creator.
- HP and Digital Equipment Corp. plan to port ActiveX's underlying Component Object Model to various Unix platforms.
- Sun is promising to revise the sandbox model in an upcoming JDK version. The goal would be to control and extend what applets can do in and out of the sandbox, such as accessing peripherals.

Extending the sandbox tops the wish list at Munich Reinsurance, Golobic says. "We've done workarounds, but you shouldn't need to do four steps in order to print."

In general, however, Golobic says he is satisfied with Java's progress toward a mature intranet architecture: "There are probably 5,000 things we'd like for Java, but I think Sun is delivering them as quickly as we can absorb them."



DOLLARS AND SENSE

BY BETH SCHULTZ

A Web-based business intelligence service is a great match for First Chicago NBD's intranet.

Sometimes all it takes is a single application to make employees swarm to the intranet. At First Chicago NBD Corp., the application that's setting commercial bankers a-buzz is a Web-based business intelligence service.

The employees of First Chicago NBD's Corporate & Institutional Banking (FCNBD C&IB) division are so enamored with the Web tool they've actually given up their once-prized possessions — Bloomberg terminals, those coveted devices that deliver up-to-the minute business and financial news. The attraction is the ease and flexibility of getting information through a Web browser, says Richard Hebda, vice president, C&IB Marketing, Customer Workstation, which is a portfolio of Oracle Corp.-based sales and marketing tools.

On a single intranet page, for example, C&IB can deliver demographics, market information and current financials of existing or potential clients. Each type of information falls into its own frame, so it's easy for users to digest. And because everything is hyperlinked, it's also easy to navigate the site.

The desire, Hebda says, is to improve productivity of the bank's sales and marketing staff. If a banker is going on a cold call at 3 p.m., for example, he can fire up his Web browser in the morning and quickly pull together the information needed for the visit.

"When he walks in to see the prospect's CFO or treasurer, it'll seem like he's known him for five years," says Hebda, adding that without the Web-based application, it would have taken two days worth of research to gain that same familiarity.

When it comes to business intelligence these days, the delivery mechanism is what really matters, not the content, Hebda says. That's why C&IB ditched its old client/server system, which Hebda says was difficult to maintain, for a service employees could get to via the intranet. That service is Newscast Today from WavePhore Newscast of Dallas.

C&IB didn't decide on the Web application without serious consideration of other options. The group first evaluated a dozen or so products, only a few of which were Web-based.

"Our interests, in terms of mobility and low maintenance, led us to the browser products," Hebda says. With the old client/server-based news system, C&IB had to maintain a host of servers and keep server and client software up to date. [Because] that was getting rather tedious, the bank wanted to avoid a similar situation with any new application. It did not want to contend with managing servers or updating software any longer.

"There's no point in having a great source of information if your employees can't access it," Hebda says.

So C&IB opted for WavePhore Newscast's Web-hosting service. WavePhore Newcast culls data from 3,000 news sources and delivers customized business intelligence packages to its customers.

FCNBD, an international banking concern headquartered in Chicago, subscribes to

Richard Hebda envisions a day when First Chicago NBD's commerical bankers get access to all the sales and marketing tools they need via the company intranet. The Web-based Newscast Today news service is the starting point.

JEFF SCIORTINO

WavePhore Newscast's basic service, and also adds some premium "channels." For example, it gets DowVision, which includes the *Wall Street Journal,* and a few feeds meant for specific groups of bankers.

C&IB employees can access the information in a number of ways. One is through an intranet page called Front Page. Hebda's group essentially has broken the page into three horizontal frames — the farthest left provides a place for hot buttons customized by the individual user, the right frame presents a customizable stock quote table and two search options and the middle section provides links to information sources the general employee population would find useful. From Front Page, bankers can directly access sources such as *American Banker,* various sections of the *Wall Street Journal* and news clippings about FCNBD.

Through one of the search options, bankers can get a dossier on a company. Keying in the stock ticker symbol MSFT, for example, would bring up a portfolio on Microsoft Corp., including links to current market outlook, demographics, Securities Exchange Commission filings, earnings summaries, Usenet feeds, press

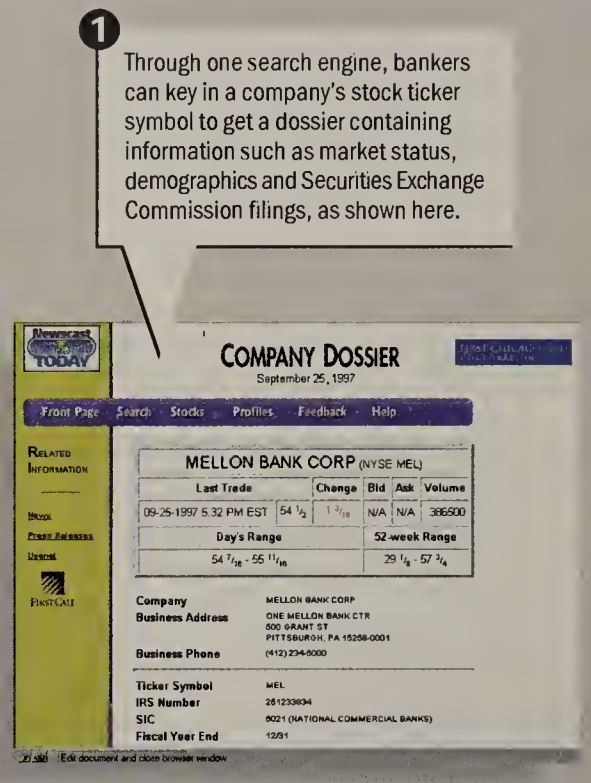
SITE SEEING

A step-by-step guide to some FCNBD intranet pages

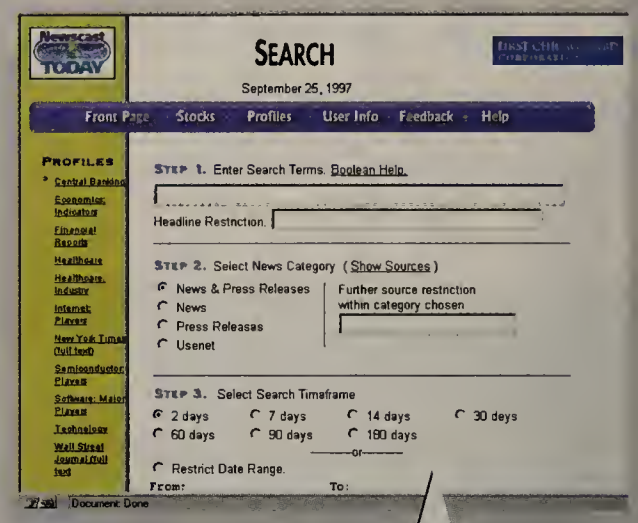
Due Diligence

Before bankers in First Chicago NBD's Commercial & Institutional Banking (C&IB) group head off to customer meetings, they hit the company's Web-based business intelligence service. The service, from WavePhore Newscast, allows them to gather information on current financials, market conditions and pertinent news events, for example, that will better prepare them for their meetings.

The service, called Newscast Today, culls information from thousands of sources and provides numerous ways for users to gather the resources they need.



1 Through one search engine, bankers can key in a company's stock ticker symbol to get a dossier containing information such as market status, demographics and Securities Exchange Commission filings, as shown here.

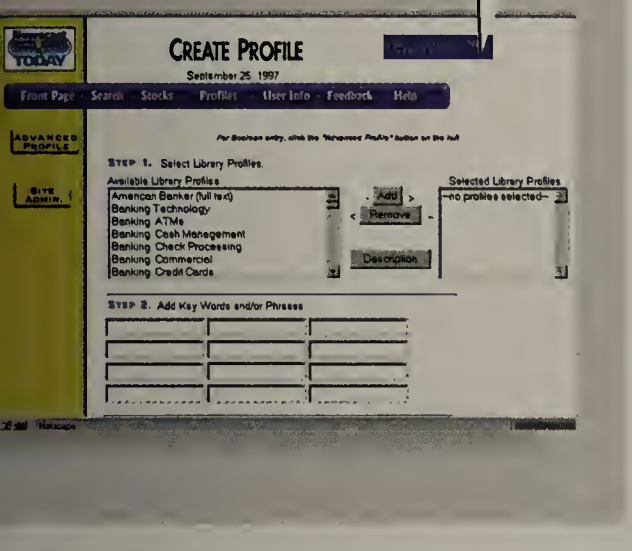


2 Bankers can use another search engine to scan the Newscast Today sources for news, press releases and Usenet postings on a particular company. They can use Boolean Logic and limit the search time frame and date range.

releases and news reports.

Another way to get to client information is via a scrolling stock ticker that is updated at user-determined intervals. Clicking on an item on the ticker, which can be set to run across the bottom of the screen when any application is up, would trigger the browser to deliver more information.

This, in a sense, is the equivalent of a Pointcast, Inc.-like "push" service. For example, if a banker is working on a merger deal, he can direct the application to alert him, via the scrolling ticker or alert window, whenever any news or stock updates on the two parties come through the service.



3 C&IB offers standard library profiles on particular industries or industry segments, but bankers also can create profiles tailored to their client set. When the Newscast Today service hits a source with information matching a profile, it sends an alert to the user.

While working within the Newscast Today application, employees' Web browsers are communicating with a host Web server at WavePhore Newscast's Dallas data center. WavePhore Newscast uses Sun Microsystems, Inc. hardware, the Solaris 2.5 Unix operating system and Apache Web server software. It exposes its Web services to customer browsers through a Common Gateway Interface layer, says Peter White, president of WavePhore Newscast.

For transaction management, the company uses Sybase, Inc. technology and internally developed software.

Users can get to the Newscast Today information with any type of browser. In C&IB's case, that means both Netscape Communications Corp.'s Navigator and Microsoft's Internet Explorer, at least for the time being. The firm is migrating desktops from Windows 3.0 running Navigator to Windows 95 with Internet Explorer, on which it will standardize.

For now, the Newscast Today application is targeted at the 2,500 C&IB bankers, about one-quarter of whom are using it. When the application came online in late summer, C&IB brought up users in the formerly disparate First Chicago and NBD firms who had news service accounts. Then it opened the application to the commercial bankers at NBD-related branches and, lastly, offered it to those at First Chicago.

Hebda says he would eventually like to make the application available to bankers in the retail and middle-market divisions since FCNBD has an enterprise license for Newscast Today. The potential population is more than 25,000 users, he says.

Given FCNBD's commitment to Windows 95, Hebda says he hopes Newscast Today will become part of Microsoft's Active Desktop, which he calls "a great metaphor" for what the bank is trying to accomplish with Customer Workstation. Through Active Desktop, Microsoft provides a way to place both Windows icons and HTML elements on a computer desktop for easier navigation. Through Customer Workstation, C&IB plans to bring all sales and marketing tools onto the intranet.

KNOWING THE NEWS

FCNBD's C&IB group has lived through the experience of migrating from a client/server- to a Web-based business intelligence service. Richard Hebda, a vice president, has this advice:

- Make sure a product really exists and is not in development.
- Worry about the delivery vehicle as much as the content.
- Verify availability of required premium news feeds.
- Validate suggestions from customers and vendor responsiveness to changes.
- Think about integration opportunities with the applications you want to build.

Bringing Newscast Today onto the intranet is giving FCNBD bankers a taste of that, and it's something they definitely don't want to go without. The phone calls came in fast and furious one day not too long ago when C&IB's Newscast Today link went down for 15 minutes. "I've never gotten that kind of reaction from any problem we've had," Hebda says.

What's more, Hebda adds, this application has increased the visibility of the intranet among the bankers in general and senior managers in particular. "Everyone sees the value, and they love it."

I've been really gratified by how much the Web is a catalyst for organizational change, especially in promoting teamwork. The internet

of the intranet to just change the way organizations work, the way people think, the way they have to work together, is exciting. I'd love to get an organizational development degree and focus on that. It's such fertile research ground.

INTRAVIEW

A Web quilting team

Sandra Bateman trusts collective thinking when it comes to developing Informix's corporate Web.

EDWARD CALDWELL

Sandra Bateman has helped Informix Software, Inc., of Menlo Park, Calif., bring together independent Web sites into a cohesive whole, match up staff members from disparate departments and integrate another company when

Informix acquired Illustra, Inc. Now, as director of corporate Web marketing, Bateman oversees planning, training and deployment of the intranet and extranet. Bateman recently spoke with IntraNet Senior Editor Peggy Watt about intranets and teamwork.

What did you start with, between Informix's and Illustra's early Web projects?

Our first internal site was called Fox, for the name of the server that it was on. Everybody just was throwing everything on there. It was sort of like the departmental refrigerator in which everybody keeps a bag lunch, and they forget to write their names on the bags, so you have no idea how old the stuff is or who owns it. But you really realize you need a new refrigerator.

That's what I walked into with the intranet, but I also had responsibility for the external Web site. And then the word 'extranet' became important because, after a few weeks, it became apparent there was this whole new area that wasn't behind the firewall but could play a role and provide things that everybody needed. So we started nearly from scratch in the fall of 1996.

What kind of staff did you have and what skills did you look for when building your intranet team?

One of my main criteria is a high tolerance for ambiguity. I want them to have a curiosity for learning all kinds of things. A company's IS and marketing sides rarely talk to each other, but this experience has been very much a mingling. We created the MIS Web services team, and we do everything together. The staff includes two 'cyberproducers,' a Web site manager and a contract graphic artist. Some part-time help is on loan from marketing communications [marcomm]. And on the IS side are about a half-dozen others, making 10 to 12 people overall on the combined core Web team.

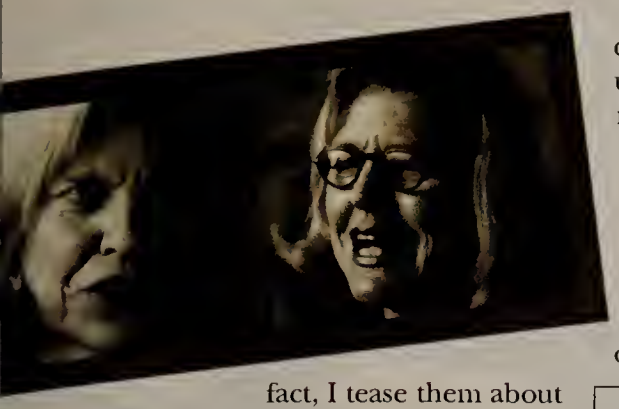
How do you encourage collaboration among these diverse specialists?

With Web projects, you need right- and left-brain people working together. You need the IS side of the house, but you need marketing. You need communications, you need the artistic side, you need the cognitive psychology side. You need all kinds of skills that are almost impossible to find in one person.

The Web makes you bring diverse people together, and management takes on a whole new role. I loved organizational behavior classes in business school because getting things done with groups of people has much less to do with technology than with people issues.

And it's worked, because people who came from the corporate marketing side are starting to sound more like the IS people. They are actually learning enough about programming that they really understand what IS faces.

By the same token, the IS people on our team are starting to sound like marketing people. In



fact, I tease them about it. It's gratifying to find out that we understand more about each other's jobs and the challenges each side faces.

But collaboration is part of the Web culture. One thing we did to get people educated and enthusiastic about this project was to take field trips. We went to Sun, we went to Silicon Graphics, we went to Hewlett-Packard. And others have come here to see what we've done.

This collaboration is exciting. There is no textbook, and everything changes every three or four months. You might as well have a good dialogue with your colleagues and other companies because everybody's going to imitate the best on the Web anyway.

I love the Web because it's opening a whole new sense of community that we need in the business world.

How have you rebuilt your intranet in the past year?

We have a new refrigerator! It's called Informix News Network [INN], with part of it being OneSource, a repository of sales and marketing materials for use by staff and partners.

The biggest challenge any company faces is getting relevant information when it's needed. With Fox, administrative assistants would get really good at finding out what was there and then checking whether it was current. But that was not productive.

OneSource was an idea in the marcomm group, which was trying to create a catalog of all its materials, multimedia presentations and resources of all kinds. This started right after the Illustra merger and has come true in OneSource. You can search by saying things such as, 'Show me all data warehousing materials,' or 'Show me all videos,' or run a subset of the search.

Who keeps all that current?

All INN content is published and maintained by the people who created it. We're working toward more remote authoring, to involve more people and get better content.

We try to make it easy for people to work with us. Our Intranet User Group meets about every other week. It actually started before the intranet did, when departmental Web servers were going up. People have created an informal networking system, to share ideas and tools. They are a beta test pool for us.

Do you evangelize the Web?

We have to evangelize. You have to constantly educate people about how they'll save time and money and open communication.

Does the Web team impose design standards or approve new intranet sites?

We provide some common graphics for pages, but otherwise we give content developers a lot of flexibility.

We want something that is clean and uncluttered, so new groups work with our graphics designer. Basically, we want people to not have to scroll if possible, and we limit the number of buttons so it is easier to navigate.

The priority is communication. Every button has a description so you never have to navigate and guess where you're going. What's intuitive to one person isn't going to be intuitive to somebody else. That's why it's important to us to have multiple links from places. We let people find things the way they like.

Did you say AGLET?

BY MARK GIBBS

JACK MORTENSBAK

Will up-and-coming mobile agents, such as IBM's aglets, become slaves on your intranet?

The idea of mechanical slaves that do our bidding and free us for more productive endeavors is one of the enduring dreams of science fiction.

While mechanical robots are far from doing anything terribly well, software robots that operate in network systems are proving useful. For example, your e-mail program might use a robot, or static agent, to retrieve and process messages on a schedule.

Alternatively, mobile agents can transfer themselves from one location, such as a server, to another location, either on user command or when the agent determines the need to do so. For example, an agent might determine it is more efficient to conduct a database search on the machine holding the database rather than across a network. By dispatching itself to the database server, running the search and returning with the results, it can operate in a faster and more resource-efficient manner.

Developers have theorized about mobile agents for some time and are now demonstrating prototypes.

Using mobile agents

Mobile agents could be beneficial when you want to render an animation of a new product, calculate a complex spreadsheet or run a sort operation on a massive database. You would simply instruct a mobile agent to take the required code to an authorized agent server with the required compute capability.

Mobile agents also could improve the method of collecting information from databases or other information sources. Even though the information extraction task might be simple, the overhead of performing the work across an intranet might be much greater than if agents dispatched to each database did the same job.

IBM's 1-year-old tool set, Aglets Workbench, is one framework for mobile agents (see www.trl.ibm.co.jp/aglets). This still is unstable alpha software, but it can be used to demonstrate principles.

IBM calls its mobile agents "aglets," a play on the words "agent" and "applet." IBM writes in Java because it provides a security framework to protect systems running aglet servers from potentially hostile aglets.

IBM's Java Aglet API (J-AAPI) provides all of the functions of aglets and the services they use. The J-AAPI is embodied in a set of Java classes that are compiled into the aglet and provide all of the support services for moving from server to server and for communications between aglets, servers and users. Aglets Workbench includes the aglet components and a stand-alone aglet server.

Central to the aglet architecture is the context, or the server environment in which the aglets execute. A single server might host multiple contexts, each with different security constraints.

Each aglet is named by an identifier that lasts throughout its lifetime. Aglets collaborate and exchange information by sending and receiving messages.

An aglet go-between

A proxy handles message transfer between aglets or between an aglet and a user. Proxies hide the location of an aglet to prevent direct access to its code and access by other aglets.

Aglets are run by a new aglet object being executed in a context or by being cloned from an existing aglet. An aglet can instigate cloning so it can dispatch duplicates of itself to other locations to carry out work.

When an aglet is dispatched to another server, its code and data is moved to the new context and deleted from the old context. When moved, aglets can do whatever the new context allows.

Aglets are sent from one context to another by IBM's Agent Transfer Protocol. This is a platform-neutral, application-level protocol that uses URLs to locate agents and servers.

When an aglet has finished its work in a context, it might push itself to another context or to the context from which it originated. Aglets also can be pulled back to a context. This means you can dispatch an aglet and leave it collecting data until you want it to return results.

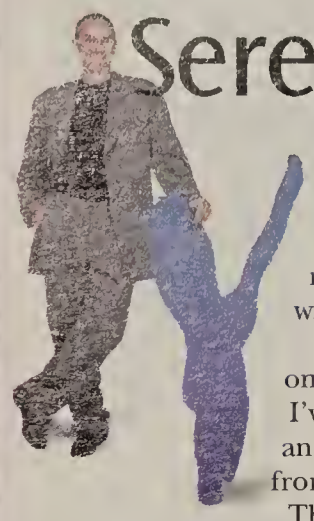
Aglets also can deactivate themselves or be deactived by a server and moved from a context to storage. Activation will restore the aglet in the context from which it was deactivated.

Disposal of an aglet halts its execution and removes it from its context.

If this sounds complex, it should. Creating a functionally rich and secure system for mobile agents requires an extensive architecture. But IBM's Aglets Workbench shows that such a system can be built.

Make no mistake, mobile agents such as aglets are not something that will appear on your intranet tomorrow. But they may appear sooner than you think.

Serenity, Courage, Weaponry and Users



Your corporate world is changing. The kinds of things you used networks for, how you built them and the responsibilities you had are going to be wildly different within the next couple of years.

The demonic force you are dealing with here started on the Internet and will wind up on your intranet. So, I've been thinking about what will happen on intranets and what weaponry you'll need to keep these changes from overrunning your company.

The coming intranet forces will necessitate:

• **Round-the-clock availability.** As the need for information becomes a prerequisite for all business practices, a minimum of 99% uptime for intranet services will become the norm down to the desktop.

• **Video support.** The videoconferencing and video mail markets are going to explode because a lot of people are not good at putting their thoughts into text. They'll turn to video communications.

• **Support for more Internet feeds.** The number of information services on the 'Net is incredible, with offerings such as weather forecasts, news bulletins and stock prices. Users will consume this torrent of information, consequently placing demands on your connection bandwidth and storage.

• **Multimedia support.** As PCs get faster, with more RAM and disk space, and their costs continue to drop, technologies such as complex compound documents become increasingly practical for presenting ideas and messages. They will be quite sizable and incredibly resource hungry. Expect 100M-byte documents to be commonplace within three years.

JOEL NAKAMURA

• **Increased incoming and outgoing bandwidth.** The trends toward video communications and multimedia content will ensure your need for tons of it. Expect to see incoming data bandwidth increase by an order of magnitude each year.

• **More internal bandwidth.** Videoconferencing, multimedia and compound documents will push bandwidth demand on internal network infrastructure through the roof. Expect to see corporate network infrastructure migrate quickly to switched 100M bit/sec Ethernet connections connected by gigabit backbones.

• **Support for multiple Internet connections.** You'll need them for reliability. When a corporation of any reasonable size gets cut off from e-mail for a day, it's isolated. As electronic commerce gets established, isolation will be too costly to endure.

• **Establishment of the corporate mesh.** The typical backbone and rib architecture will not be able to meet the demands of required uptime and bandwidth. In its place will emerge many small segments connecting to multiple switching hubs that provide failover redundancy.

These trends will have an interesting impact on things such as:

• **Data storage.** With users driving intranet content acquisition and the difficulty IT faces in determining what content to keep and what to dispose of, corporate data stores will grow exponentially. With disk space becoming cheaper every month, arguments against storing large amounts of data because cost won't work.

• **Search engines.** Users will need to run search engines against intranet content on a continuous basis looking for trends, new business factors and false or misleading data.

• **Useless data.** As data storage increases, the amount of outdated or otherwise valueless information — dead wood — will grow rapidly.

• **Dangerous data.** Among the dead wood will be data that is believable, but hard to place in context. Base decisions on this data, and your business might suffer.

• **Knowledge officers.** People who understand the company's data and information context and content will become corporate assets.

The biggest challenge you'll face is tying it all together. A huge pool of poorly structured data that is loosely coupled to business operations could have dire consequences. The challenge centers on the fact that intranets grow organically. This makes it difficult for IT to exert the kind of control that provides a strong structure for information management.

The key to making intranets work really well will be to train users in information-handling techniques. Unless your users have a solid grounding in how to deal with the flood of data, the percentage of useless and dangerous data will explode.

Some of the techniques required are simple. Content must be dated and the owner's name included for verification purposes. If one page depends on another, changes in either must be monitored to prevent errors.

But the bottom line is the value of intranet content will be controlled by users. And unlike traditional environments in which the relationship between users and IT tends to be adversarial, intranets demand cooperation.

In the future, users will be your best weaponry.

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Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

I am the administrator of a 10Base-T Ethernet LAN with about 10 hubs, 300 PCs running the Windows operating system and a few NT servers. I would like to be able to easily monitor LAN traffic/bottlenecks, inventory hardware and Internet access. Any suggestions for reasonably priced software that will provide these capabilities?

Via NW Fusion

I know of several software packages that address your needs.

For monitoring LAN traffic/bottlenecks, look at Novell, Inc.'s ManageWise, which offers support for a number of third-party products. This means you stand a good chance of being able to monitor and potentially configure devices such as Cisco Systems, Inc. routers and Compaq Computer Corp. switches via the ManageWise console.

You can monitor the traffic segment by segment without having to move a sniffer to each segment as you watch for problems.

Although you are running a Windows NT network, I think you will find that ManageWise can fit in nicely. Novell has an NT Agent for ManageWise that allows NT servers to report problems to a central console.

ManageWise also provides a hardware and software inventory function and, if more detailed reporting is required, offers support for third-party snap-ins that provide complementary or replacement inventory functions.

When looking at Internet protection, you should look at inbound as well as outbound connections. Novell's BorderManager provides the ability to monitor and control access to Internet resources beyond what is currently in use. As long as you know the IP Socket number that a particular Internet service uses, you can control access to that service. Access can be limited by user, group, time of day or some combination thereof.

InfoBus: The truth about Java and its beans

By Mark Colan

The widespread interest in Java among the Internet community presents an opportunity for developers to create a new class of interactive Web applications.

A new technology, Lotus Development Corp.'s InfoBus, allows any InfoBus-enabled JavaBeans to share and exchange information with no additional programming.

InfoBus makes it easy to quickly create powerful and interactive Java and Internet/intranet applications for client and server environments using an industry- standard protocol for data exchange.

Lotus developed InfoBus as part of its overall Java effort, code-named Kona, and it was quickly endorsed by Sun Microsystems, Inc. as the standard for information sharing among JavaBeans.

Last July, the draft specification for InfoBus was posted to the JavaSoft Web site for public comment at www.javasoft.com/beans/infobus.

When building multicomponent Java applications, developers often need to enable Java components to share data. Before InfoBus, this typically was achieved by writing JavaScript code to control the two applets or by specifically designing the applets to permit them to communicate with one another.

Such private contracts limit the exchange of information to beans written with prior knowledge of a particular protocol.

Public API

InfoBus defines a public API that can be implemented by any Java classes, beans, applets, servlets or other applications to provide the ability to talk to other InfoBus-speaking applets.

All InfoBus-enabled applets know how to respond to requests for data from other InfoBus-enabled applets, without any prior knowledge of their internal workings. This lets developers create new application-sharing features from different components.

With InfoBus, developers can avoid the burdensome and time-consuming process of manually linking JavaBeans through script. Applet developers can add standard data-sharing capabilities to their JavaBean applets, enabling them to be snapped easily into Internet applications with the confidence they can share data with other InfoBus-enabled applets.

The strength of InfoBus lies in the fact that large amounts of data of various types can be shared directly with other InfoBus applets using an industry-standard protocol.

InfoBus coding is fast, direct and requires little instruction. Components that make up an InfoBus application can be classified into three types:

- Data producers — components that respond to requests from data consumers.
- Data consumers — components interested in hearing about any new data sets that enter the environment.
- Data controllers — the InfoBus traffic cop, optional components that regulate or redirect the flow of data between data producers.

InfoBus is similar to a hardware bus. Multiple consumers can receive and use data published by a producer, and a consumer can easily obtain data from multiple producers.

In fact, a request for data can elicit multiple responses. Multiple conversations can occur simultaneously without requiring anything special from the participating components.

Reduced costs

InfoBus can reduce the cost of developing and deploying applications by allowing a Web-based application to be assembled using JavaBeans and InfoBus without any explicit programming. For example, a database-access JavaBean can retrieve information from a relational database and publish it onto InfoBus. This makes the information accessible by other JavaBeans, which may then display or process the information.

InfoBus also provides a framework for the producer to notify the consumer when the data changes.

The InfoBus architecture was designed to be simple to use yet powerful enough to handle real work flow for multiple components on a Web page. With InfoBus, it is possible to access data directly between applets.

InfoBus is not designed as something you put data on. Rather, it defines a mechanism by which two beans can exchange data directly without making a copy of the data. Copying data for exchange is inefficient; what Lotus InfoBus provides instead is a means of direct access from one component to the other.

InfoBus supports a stylized protocol for data exchange between InfoBus components, which consists of two major elements:

- InfoBus participation — Any InfoBus-enabled Java component can connect to the InfoBus Rendezvous on the data to be exchanged. In the InfoBus model, this rendezvous is asynchronous. Data producers can announce the availability of new data as it becomes ready. Data consumers solicit data from producers as they require it.
- Data access — Different data producers can provide different types of data while consumers may wish to access this data in simple or complex ways. To accommodate the needs of both producers and consumers, InfoBus defines a number of standard data access interfaces for exchanging data. These interfaces give the data consumer choices about how to navigate through the data provided by producers.

The final specification and a release compatible with Java Development Kit (JDK) 1.1 will be available in the next few months. A product that uses JDK 1.2 security features will follow shortly after.

Lotus will continue to work closely with JavaSoft to ensure that future releases of InfoBus capitalize on new JDK features.

Colan is the lead architect of InfoBus technology. He can be reached at (617) 577-8500.

UP CLOSE

Ridin' the InfoBus

The InfoBus is a Java API that lets Beans or other interoperable applets on a Web page communicate with each other. The idea is to standardize the way applets and Beans communicate with the Java Virtual Machine. With only 30 call commands, the InfoBus implementation takes up approximately 4K bytes of memory.

By deploying InfoBus, users and developers can:

- Improve applet-to-applet performance.
- Reduce the amount of manual coding needed to link JavaBeans.
- Improve data sharing capabilities.
- Ensure compatibility with other Java Beans.
- Pull data from multiple resources, such as databases, spreadsheets or word processing applications and easily tie it all together in a single application.

Need information?

Let *Network World* provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Michael Cooney at (508) 875-6400 or michael_cooney@nww.com.

EDITORIAL *insights*

On to the next showdown: Network and systems management

Thank God for competition.

To watch the vendors in our Gigabit Ethernet Face-off at NetWorld+Interop 97 Atlanta was to see the free marketplace in all its Darwinian glory — the session was an unqualified sucess. The executives from Bay Networks, 3Com, Extreme, Prominet, Alteon and Foundry exchanged pleasantries before the event. But as soon as the debate kicked off, they were quick to attack one another — probing weaknesses in product lines and pricing, and pouncing on inconsistencies in the others' positioning.

This was fun, even though *Network World* took a few jabs from the contestants along the way. The net result of all the sparring was attendees got a better understanding of Gigabit Ethernet today, with all its warts, and a delineation of how the vendor strategies differ. To read the full transcript of the debate, go to www.nwfusion.com/news/1013transcript.html and enjoy the fireworks. (If the introductory remarks seem a bit strange, picture *NW* News Editor Doug Barney in full hockey regalia and things might make more sense.)

This Face-off was the second presidential-style debate I've hosted, following on the heels of our Switching Showdown at ComNet early in the year. I find the format is a refreshing change from the standard three-speakers-with-PowerPoint-slides approach of most conference sessions, because the speakers cut the hype and marketing drivel.

So on to the next debate. With help from the folks at ComNet, I'll be staging a showdown among the top suppliers of network and systems management platforms. My goal is to explore the future role of these platforms — which in many ways have failed to live up to their initial promise — and to help buyers understand which vendor is best positioned to help them manage their networks and computers in an Internet/intranet world. (ComNet will run January 26 to 29 in — where else? — Washington, D.C. Check out the details at www.comnetexpo.com.)

Among the companies I'm considering challenging are IBM/Tivoli, Cabletron, HP, Sun, Computer Associates and Boole & Babbage. But I'd like to hear from you. Which platform suppliers do you want on the podium?

In addition, what do you want us to ask them? I'm even looking for a customer or two to put on our panel of experts to question the vendors. Drop me your ideas on the key issues in network and systems management and let me know if you're keen on taking part.

I'll be providing more information on this showdown in the coming weeks. For now, let me know who you want to see under the microscope. I can't wait.

John Gallant, editor in chief jgallant@nww.com

Totally Unplugged • Ira Brodsky

From a user perspective, stupid nets are a smart idea

Telephone companies want you to believe intelligent networks, in which you depend on centralized resources for enhanced features, are the wave of the future. But the truth is, telcos cooked up intelligent networks to save their own hides. The future belongs to stupid networks — networks that do just what users tell them to.

This insight has been skillfully articulated by a most unlikely source. David Isenberg, a self-described telephone company nerd at AT&T Labs, has dared to think the unthinkable: The days of centralized, switch-based telephone networks are numbered. In his paper, "Rise of the Stupid Network" (www.ComputerTelephony.com/ct/att.html), Isenberg contends we are moving inexorably toward a new model — one in which bits are transported between intelligent endpoints by networks that are, well, stupid.

The telcos' intelligent network scheme is based on a series of false assumptions: voice always will account for most of the traffic; circuit-switched calls will predominate; a primary goal of infrastructure is to help people share scarce resources; and networks must be centrally controlled. These assumptions have been shattered by what is perhaps the first truly stupid network: the Internet.

Isenberg challenges the phone companies' claim that the intelligent network was conceived to improve customer service. Intelligent networks mainly deliver billing enhancements that benefit telcos more than customers.

Isenberg also disputes the assertion that intelligent networks facilitate the introduction of new features. In reality, a new feature must wend its way through a labyrinth of telephone company bureaucracy and will only become available if and when the phone company gets around to it.

Telephone companies invented the intelligent network as a way to preserve their dynasty. Twenty years ago, the word network was synonymous with dumb telephones connected to slightly smarter switches. As microprocessors proliferated, telcos responded by putting more intelligence in centralized resources. Today, the intelligent network represents a conglomeration of digital switches, service control points and intelligent peripherals. The world remains safe for users with dumb phones, but most important, the world remains safe for phone companies with big, expensive switches.

Meanwhile, everyone else has been busy snapping up products that undermine the telcos' hegemony. Today's end users possess a wide assortment of intelligent devices — from digital PBXs to fax machines to PC modems to cellular phones. The word network now may refer to a private Ethernet as readily as anything else.

In an intelligent network, the network tells the data where to go. In a stupid network, the data tells the network where to send it. The intelligent network assumes scarcity; the stupid network assumes abundance. But most important, the intelligent network preserves telephone company control while the stupid network shifts control to the end user.

Giving control to users is a major innovation. Just as microcomputers freed people from having to rely on mainframe programmers, stupid networks permit users to upgrade voice quality, create additional channels and add new functions merely by swapping or reconfiguring endpoint software.

One of Isenberg's most interesting observations is that the Telecommunications Act of 1996 was just an attempt to shore up the old order. Rather than busting open the market, the Telecom Act established new ways to partner with the telcos and their supposedly unbeatable intelligent nets.

But users aren't buying it. Instead, they are rallying around a new slogan: "Just transport the bits, stupid!"

Brodsky is president of Datacomm Research Co., a Chesterfield, Mo.-based consultancy. He can be reached at ibrodsky@ix.netcom.com.

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

Cisco challenges results

Your editorial "Cisco and IBM: Time to stop talking the talk and walk the walk" (Aug. 25, page 30) highlights the confusion surrounding the performance comparison of IBM's 2216 gateway with Enterprise Systems Con- nection and Cisco's router with Channel Interface Processor (CIP). We at Cisco agree with your statement that data center managers are suffering from a lack of accurate information.

Specifically, Cisco dismisses the IBM/Tolly Group performance test results as inaccurate and far from vendor independent. The tests were conducted at IBM's Washington Systems Center,

Are data VPNs ready for takeoff?

In the weeks leading up to NetWorld+Interop 97, and at the show itself, we were subjected to such a dizzying explosion of hype that it's hard to spot a trend. Despite this, vendor support for virtual private networks (VPN) has been strident enough to be conspicuous.

Data VPNs are private network overlays on a public IP network infrastructure such as the Internet. The theory is by drawing on the economies of transmission and switching that the larger Internet creates, VPNs would cost less. The theory seems valid, but VPNs raise issues that may tarnish their economic benefits. Security, for one. Quality of service (QoS), for another. Even address management becomes an issue.

Users want data VPNs to work like voice VPNs — as private networks hosted on public facilities. That means everything within a VPN must stay as independent of interception or hacking as would a private network. It means carriers must specify some level of network performance to justify the cost. And it means carriers must not impose limits on addressing or type of protocol.

None of these requirements come naturally to IP networks, which is why VPNs aren't sweeping the market right now. But vendors and carriers want that to change, and new developments suggest VPNs may succeed.

The most popular approach being taken by VPN vendors involves tunneling. A tunneling protocol establishes an end-to-end connection through a public IP network — the Internet, for example — that looks a bit like a virtual circuit. Users can put any type of traffic, even non-IP traffic, into the tunnel where it whizzes through the network and comes out the other end. The tunnels only go to designated destinations — members of the VPN — so the process is supposed to be secure. The tunnels can be given resource priority using something like Resource Reservation Protocol so they can provide QoS. Everything's fine.

Yeah, sure. You can believe that tunneling provides QoS and security if you believe the Internet has service quality and is secure. Anything that lets you intercept an IP datagram lets you intercept a tunnel. Anything that delays an IP datagram delays tunnel contents. Tunneling, in itself, contributes nothing to creating a practical VPN beyond creating the illusion of separation.

Some vendors are starting to step beyond tunneling, however. Last month Lucent Technologies announced its OneVision network management system. OneVision has the ability to create and define service objects that represent VPNs and map them to ATM virtual circuits. This announcement didn't attract much press attention because it wasn't sufficiently IP-oriented, but other vendors have followed Lucent's lead.

For example, late last month Ascend Communications announced a series of management system provisioning tools called NAVIS. Like the Lucent tool kit, NAVIS provides for service-object creation but adds drag-and-drop VPN provisioning. Ascend also addressed the issue of IP VPN building in the core network, using its previously announced IP Navigator software.

With IP Navigator, or any software based on the evolving Multi-protocol Label Switching (MPLS) standard, a source knows a destination by a tag or label. If VPN traffic is assigned a unique label, it will flow onto a different set of virtual circuits in a core network, separate from those used for public service, such as the Internet. Different virtual circuits means real security and real potential to control QoS. Thus, by making the edge devices in a MPLS-compliant network aware of VPN services, both security and QoS can be assured.

Newbridge Networks has countered with its own scheme, based on Multi-Protocol over ATM (MPOA). In the Newbridge Carrier-Scale Internetworking architecture, different route servers are used for each VPN, segregating them from one another and from the public Internet. When an MPOA agent requests an IP address be decoded into an equivalent ATM address, the VPN identity determines which route server does the decoding. The networks are kept independent. The use of ATM switched virtual circuits for the connections allows QoS management. Better still, Newbridge is promoting its approach through a partnership program that will allow VPNs to extend through your network to the desktop.

The wild card here is Cisco. While the Ascend and Newbridge strategies are technically effective, neither vendor has the lion's share of the current public IP market. Cisco can make or break the VPN concept depending on how it approaches the issue of public carrier VPN building.

Cisco has a problem here. As the premier router vendor, as well as an ATM vendor, everything Cisco does in the VPN space will be examined to see how it impacts the vendor's position on switching vs. routing.

Risks aside, Cisco has to do something or risk losing credibility in the critical VPN market. Maybe it should take a hint from Ascend, Lucent and Newbridge and make a strong network management and provisioning story out of its announcement, thus deflecting attention from the core technology issues.

Or maybe we'll get smart and realize it's provisioning that will decide how useful VPNs will be. When you read stories on VPNs or consider vendor VPN architectures, look for words like "object-oriented provisioning," "service creation" or "service level agreements" and give the network management features a special look. This is one time when management is more than a tick on an RFP.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (609) 753-0004 or tnolle@cimicorp.com.

where they were then certified by a Tolly Group engineer. No one at the Tolly Group contacted Cisco regarding the tests until the results were published.

Cisco was then allowed to review the test methodology and the configurations. Our review showed that the Cisco routers were clearly configured for less than optimal performance. Readers can get the results of our review at www.cisco.com/warp/public/733/ip/cip/dasen_wp.htm.

In fairness, our records do indicate that someone from IBM's Washington Systems Center contacted our support center during the tests.

But the records also indicate that the caller was very inexperienced at configuring Cisco routers and evasive when asked questions about the network design criteria and objectives.

Cisco has been successfully shipping the CIP for three years. We have numerous customers who will speak to their performance numbers, which are significantly higher than those reported in the IBM/Tolly Group tests.

We will publicize actual customer test results in the next 45 days. We feel this approach will serve customers much better than showing them individual, vendor-derived and obviously biased tests results.

Selby Wellman
Senior vice president, corporate marketing and general manager
InterWorks business unit
Cisco Systems, Inc.
Research Triangle Park, N.C.

Kevin Tolly, president and CEO of The Tolly Group, responds: *Frequently when large-scale tests are run, The Tolly Group will send its engineers off-site to conduct the testing.*

This in no way invalidates the test, as The Tolly Group engineer is directly involved in methodology specification, system configuration, test prototype and execution, as well as measurement verification.

For the tests in question, Cisco's technical support channels were used to provide configuration parameters. This approach is the same used when, in the past, Cisco commissioned The Tolly Group to perform competitive testing.

While Cisco contends the results are inaccurate, the company has not provided us with a single concrete example.

Furthermore, we have reviewed Cisco's analysis and have notified Cisco of multiple inaccuracies found therein.

We continue to strive, as always, to provide unbiased, accurate information to network managers worldwide.

Don Haile, IBM vice president of networking hardware development, adds: *We stand behind our test results and the integrity of The Tolly Group.*

IBM and The Tolly Group went to great lengths to ensure the tests were conducted fairly and were independently audited.

Customers are well served to closely question test data that has not been subjected to such independent certification.

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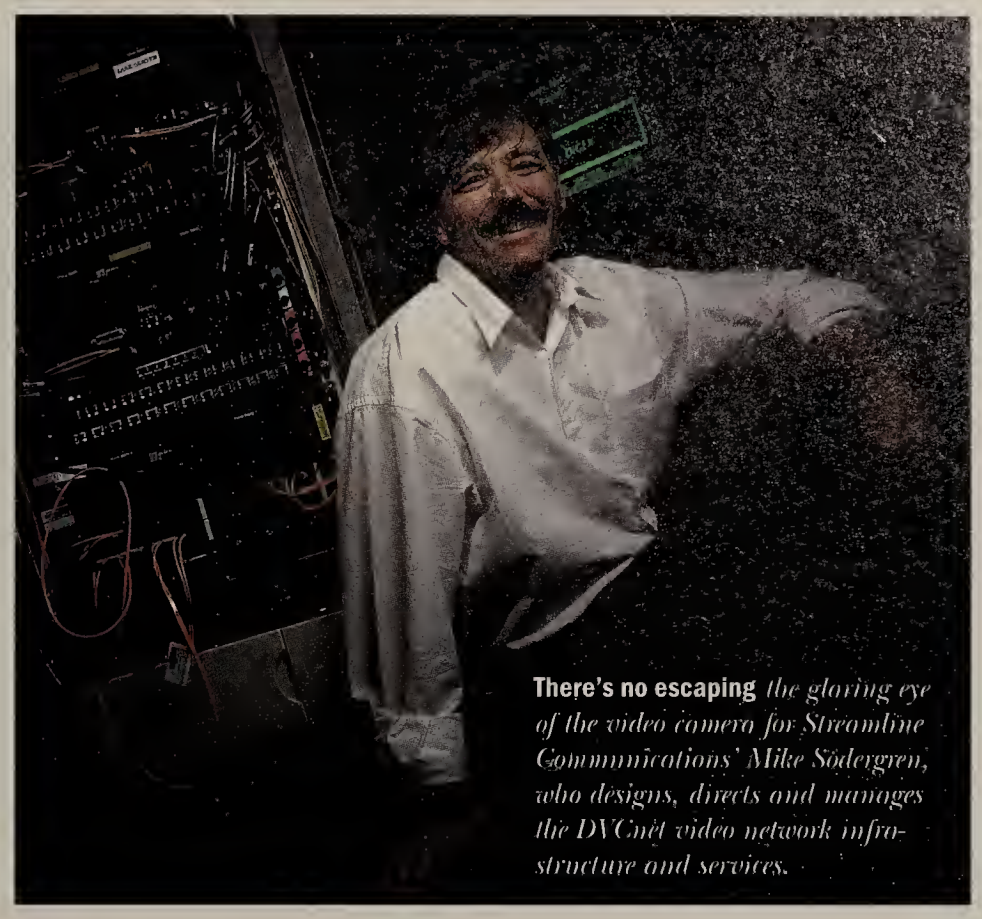
By Christine Perey



There's no escaping *the glaring eye of the video camera for Streamline Communications' Mike Södergren, who designs, directs and manages the DVCnet video network infrastructure and services.*

STAN BAROUH

Videoconferencing is quickly becoming a reality you need to address. If you don't deploy it yourself, your users probably will. The questions are: When is the right time to begin a managed rollout and what should you do to prepare?

"Microsoft (Corp.'s) NetMeeting 2.0 is making its way into organizations whether network managers know it or not," says Pete Balkus, director of engineering for network systems at PictureTel Corp., noting that users are constantly downloading the product. Interest in real-time collaboration will rival that of the Web when it was first discovered and a variety of free downloadable browsers became available, Balkus says.

Don't panic yet. A few simultaneous low-bandwidth sessions won't immediately down the average corporate network, says Balkus, who extensively tests NetMeeting 2.0, PictureTel's LiveLAN 3.0 and many less stable products in a lab setting. While conferencing won't be particularly disruptive at first, remember your resources are probably optimized for transactional data types, not audio and video. Network monitoring tools can help, but proactive planning and testing is a better solution.

To learn what it takes to build an interoperable H.323-compliant packet video net, *Network World* went to the experts who assemble and run demonstration networks. We recently attended the Desktop Video Communications (DVC) Conference and Exhibition and also spoke to the International Multimedia Teleconferencing Consortium. This is the blueprint culled from the shared experiences of the folks in the trenches.

Above all, the experts agree, adhere to the basic principles of good network design. Overbuild for the applications your net will have to support now and in the foreseeable future, and control the number of features you include.

Merging all forms of communications onto a global packet-based network facilitates multimedia messaging, collaboration and conferencing, and provides other benefits such as integrated resource management and scheduling.

But interoperability of products has been a major stumbling block. Without interoperability, one vendor has to provide all the required network equipment. Buyers also have difficulty integrating new purchases with existing media.

However, international standards groups have recently or will soon ratify several protocols for the packetization and management of audio and video data streams. Most notably, the International Telecommunications Union is finalizing the second version of the H.323 recommendation for real-time multimedia in packet-based networks. (For more on H.323, see the story on page 60).

H.323 is just a recommendation that is open to interpretation. However, vendors have a market incentive to ensure their products interoperate with competing wares. For example, one developer's gateway will work on a production network comprising various competitors' terminals, making it easier for sites to purchase components from different vendors as their application requirements evolve.

H.323 also is expected to spur feature differentiation and lower prices as a result of competition.

But that's all down the road. At least 30 independent implementers today are working on solutions with various degrees of interoperability. The problem with being an early adopter is that there's little hands-on experience with H.323-compliant products. But you can learn from the pioneers who have worked with the products in demonstration networks and private labs.

Testing, testing, H.323

DVCnet, assembled at the semiannual DVC show, is one of the largest demonstration networks for multimedia-intensive conferencing and collaboration products and services.

DVC '97 East was held last month in Washington, D.C. DVC '98 West is scheduled for April 27 to 30 in Santa Clara, Calif. DVCnet gives vendors the chance to showcase their ability to interoperate with other exhibited products. Ethernet, Fast Ethernet and ATM serve as LAN connections. At DVC East, Bell Atlantic's T-1 services, Internet service provider DIGEX, Inc., and several commercial video network gateways all provided WAN connectivity (see graphic, page 64).

"Our goal is to have a pre-production network as close as possible to the production network's design specifications, given the state of the industry's products," says Mike Sodergren, president of Streamline Communications Corp., of San Jose, Calif., and technical director of DVCnet. "We must provide a cost-effective way to do H.323 conferencing with multiple QoS, depending on the application."

The DVCnet H.323 portion of the network combines off-the-shelf Category 5 wiring, network interface cards, Ethernet switches, aggregators and access devices with H.323 conferencing-aware entities such as terminals, gateways, gatekeepers and multipoint control units.

Bandwidth usage is determined on a segment-by-segment basis for provisioning based on application type. For example, Microsoft Corp.'s NetMeeting requires less than 20K bit/sec for each bidirectional audiographics session. But if a hardware codec will be streaming 30 frames per

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Maximum number of simultaneous full-duplex videoconferencing sessions per link.

	Shared 10M bit/sec Ethernet	Switched 10M bit/sec Ethernet	Shared 100M bit/sec Ethernet	Switched 100M bit/sec Ethernet	T-1	T-3
etMeeting	54	140	546	1406	21	629
iveLAN 174K	20	51	201	517	7	230
iveLAN 384K	9	23	96	234	3	104

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second of video, it will require upwards of 500K to 700K bit/sec.

Bandwidth allocation is important. The Resource Reservation Protocol (RSVP) provides a mechanism to reserve bandwidth for a particular end-to-end intranet or Internet-based session. It will address the bandwidth allocation need to some degree when it's phased into existing networks over the next few years.

DVCnet East didn't run RSVP across the entire network, but individual subnets could use it to manage bandwidth reservation for calls placed in that subnet. Your video communications network ideally should provide RSVP service on all routers between the end points you wish to connect via audio or video. If you can't upgrade your entire network to RSVP, focus on those links in which bandwidth constraint or heavy utilization likely will cause traffic delays or packet loss.

Terminals configured with IP addresses "discover" and register with a server-based gatekeeper that defines a zone. Gatekeepers resolve addresses, including aliases, determine bandwidth availability and support numerous supplementary telephony-like services, such as call forwarding, routing and answering.

When a DVCnet gatekeeper acknowledges a call and resources are available, users can call each other within a subnet (e.g., a single booth with multiple terminals), between subnets (different booths typically configured as unique zones), or outside the intranet. Administrators also can monitor activities and enforce usage policies from the DVCnet Network Operations Center.

The hardware- and software-based H.323-compliant multipoint control units scheduled to ship in December will provide support for optional multipoint capabilities. Until such H.323-compliant products hit the street, some multipoint is possible through multi-unicasting, in which every terminal unicasts to other participating terminals. However, this provides far less efficient use of bandwidth than multicasting would. In order to take advantage of multicasting during a particular session, multicast support needs to be present in the client as well as in all the network components between communicating end points.

"We support multipoint via CGMP (Cisco Group Multicasting Protocol) in all the components," says Chris McGugan, product marketing engineer for Cisco's enterprise product line. McGugan installed DVCnet's enterprise-class components.

"We designed a robust physical network, not an applications-specific network," says Sodergren. An unlimited number of unique gatekeepers and terminals can access other terminals regardless of zone and also can access the Internet.

Each terminal can use different gateways for calls with non-H.320 terminals. H.323/H.320 gateways to ISDN facilitate calls to H.320-compliant videoconferencing systems. Future support for H.323/H.324 gateways will bridge the LAN and plain old telephone service (POTS) networks to link H.324-compliant videoconferencing systems, Sodergren says.

An H.323 demo network doesn't mandate that all callers connect through a particular gateway, since this isn't likely to work in real-world production environments. Different groups can tailor the capabilities to their application requirements. For example, a multimedia call center with intelligent call handling may be using H.323-compliant terminals to support multiple agents' calls in a LAN, but the wide-area customers have regular analog telephones and H.324-based video systems that use POTS lines. In this case, an H.323/H.324 video network gateway would be the most appropriate choice.

Similarly, a senior manager's desktop may be linked to an internal H.323 network, but an H.323/H.320 gateway supporting 384K bit/sec sessions might be needed so they can conference with an H.320-compliant room or group system at another facility.

This level of network independence excites users who hear about H.323 visual communications. Workgroups in the near future will purchase video networking products without obtaining IT managers' approval, Sodergren predicts. Business managers who need the latest video communications functions will assume IP support will allow them to use whatever the vendors are selling, he says.

How to optimize for streaming media

One of the weakest links in existing networks may be the wiring. Substandard wiring has posed a significant problem at several DVCnet venues, Sodergren says. The best remedy? Upgrade. "If you see multimedia is going to come to your network, start beefing up at the lowest OSI layer, the wiring," he says.

Category 5 wiring is critical to multimedia, says Kevin Cook, network systems project manager at Telecommunications Management Solutions, the Campbell, Calif.-based company that wired DVCnet. "Where there's Category 5, advanced applications, including video and audio, rarely run into problems," he says. "What customers like most is the ease with which they can upgrade the hardware from standard to Fast Ethernet. Going with Category 5 buys the customer flexibility for the future."

RADVision's director of technical support, Avi Moyal, has been installing and supporting RADVision's proprietary and standard-compliant H.323 video network gateways in customer facilities for over three years. Digital video or IP telephony isn't specifically sensitive to the type of network wiring and even can run over Category 3. However, video is sensitive to interference, Moyal says.

Environmental noise increases packet loss and degrades QoS regardless of the software protocols used in the routers, switches and terminals. Category 5 immunizes the traffic from common sources of interference. It's also more cost-effective to configure multiple networks such as voice and data with Category 5.

But no network can be truly trouble-free. All the early H.323 network designers and managers suggest using a network monitoring device to get

What the heck is H.323?

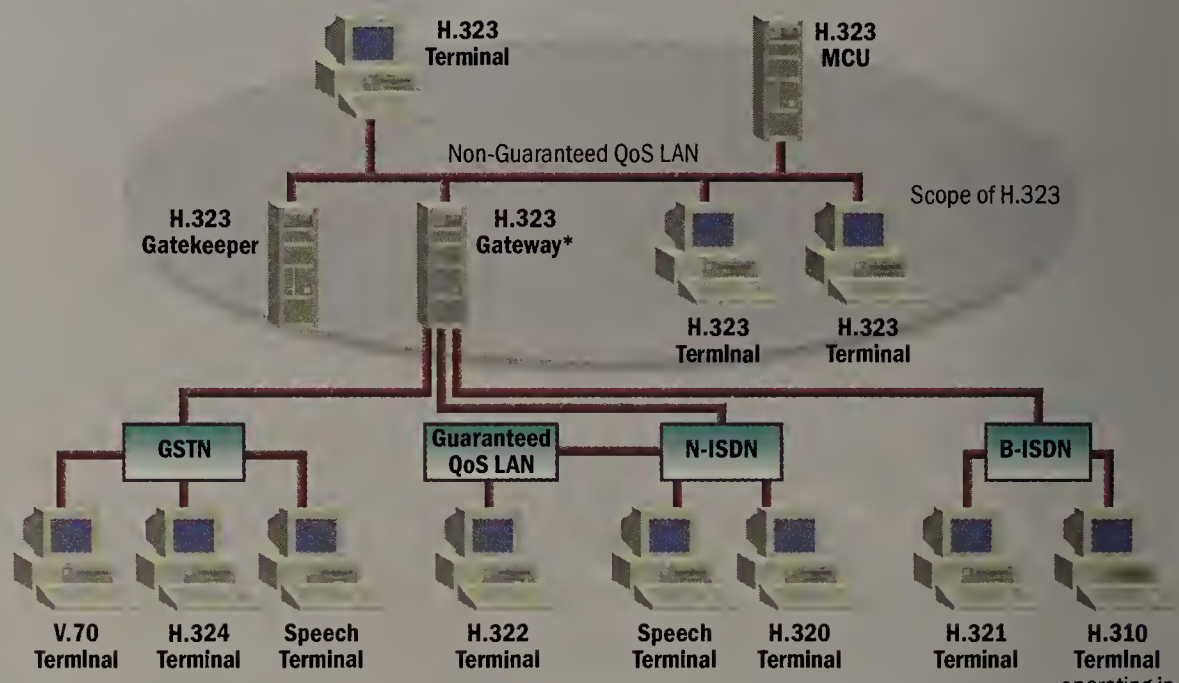
H.323 is an umbrella document that outlines how to provide real-time multimedia communications over packet-based networks that don't offer a guaranteed quality of service.

The specifications define several new network components — such as an H.323 terminal, H.323 multipoint control unit and H.323 gatekeeper — that use an H.323 gateway to interoperate with other standards-compliant end points and networks.

The International Telecommunications Union recommendation is prone to interpretation due to the limitations of written language and uncertainty about future system requirements. Recognizing this, the International Multimedia Teleconferencing Consortium sponsors an initiative to unite protocol stack developers in an open environment to reach a consensus on their current interpretations. The consortium also is testing the interoperability of its stacks and product prototypes.

Most video and voice H.323 vendors and service providers are licensing the H.323 stack to dramatically reduce their time to market and ensure interoperability with other H.323-compliant products. The stack is offered with developer's tool kits from DataBeam Corp., RADVision, Inc. and Lucent Technologies, Inc.

H.323 NETWORK COMPONENTS SPECTRUM



* A gateway may support one or more of the GSTN, N-ISDN and/or B-ISDN connections.

SOURCE: ITU H.323 Recommendation

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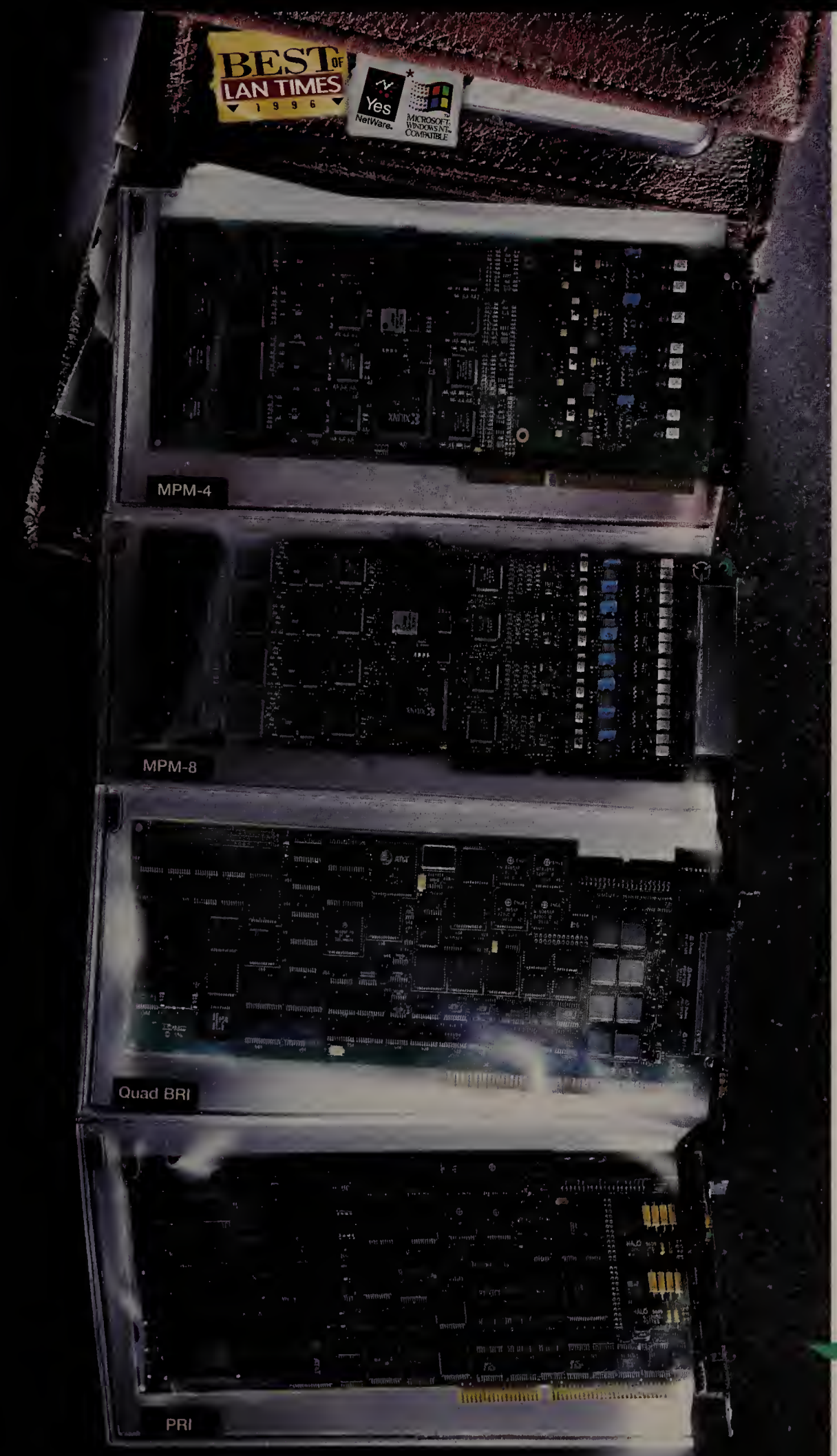

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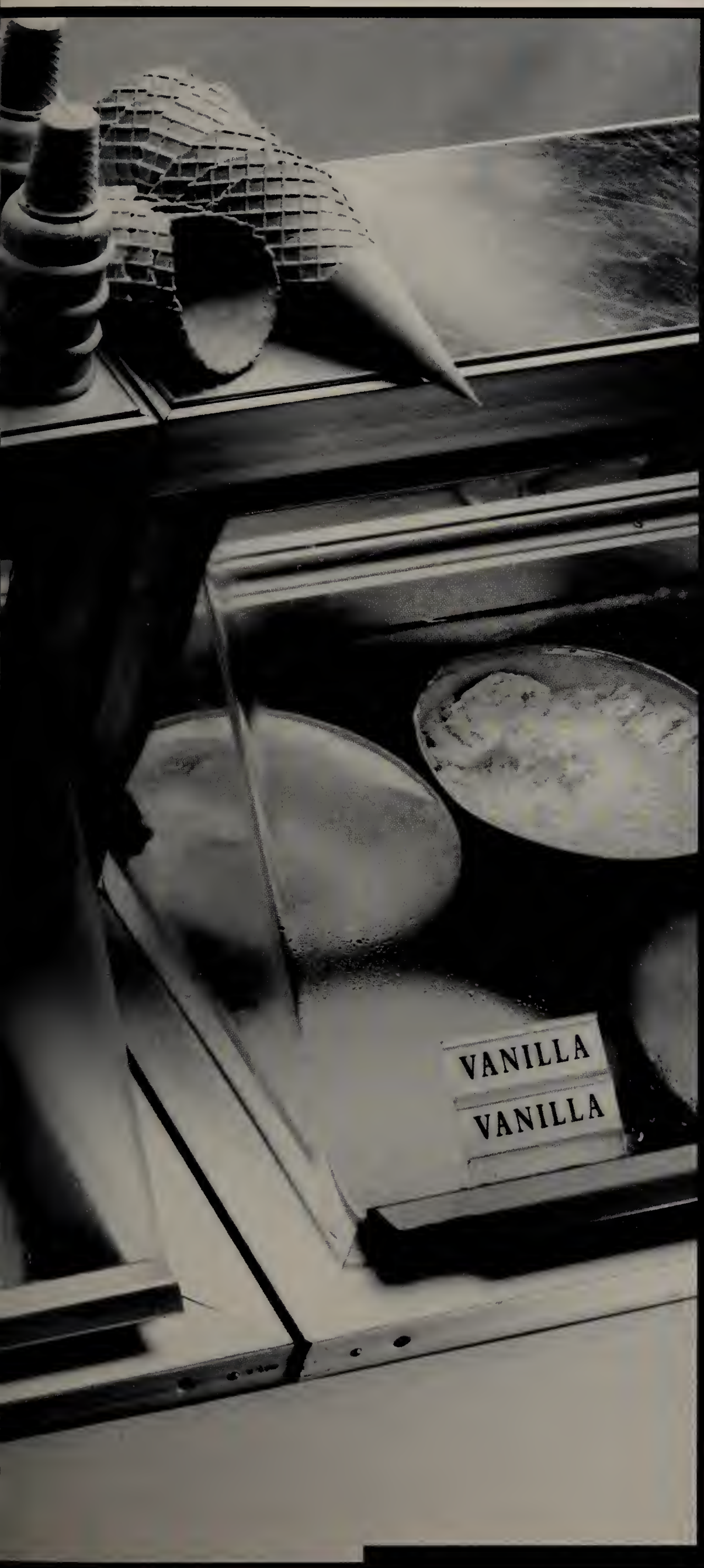

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a good understanding of where and how bandwidth is being consumed. Properly set up, a Remote Monitoring (RMON) probe will report the number of clients who send real-time video and audio on a segment, total bandwidth consumption, errors, collisions, cyclic redundancy check errors and so forth.

Balkus' lab engineers needed to understand how latency and jitter would affect a particular session. They developed diagnostic routines that run within LiveLAN 3.0 to assess the condition of the round-trip network before or during a call. PictureTel also developed the NetTach standalone diagnostic utility with leading RMON vendor NetScout Systems, Inc., of Chelmsford, Mass. NetTach comes with PictureTel's forthcoming NetConference 1.0 H.323-compliant multipoint conferencing software for Windows NT enterprise servers.

Running on the PCs initiating and receiving the conference session, NetTach rates the network path between all parties on its ability to support videoconferencing. Participants can run it just prior to the call, or may continuously use the software utility to log and graphically depict resource utilization and network performance at the desktop. A red light means the network will not support a sufficiently high QoS, yellow indicates there's some difficulty, and green means the current conditions are favorable for a conference. Network managers also can run NetTach from a server to diagnose congested areas and modify access policies without going to users' desktops.

Dealing with the unknown

A demonstration network like DVCnet or one deployed in select technology labs poses relatively few unknowns. Everything is closely controlled and exhibitors exchange IP addresses. But the fact is, a user in a real production environment won't know the IP address of everyone he or she needs to conference with.

Administrators' video network deployment challenges will be compounded by the need to invest significant resources in designing and supporting efficient addressing schemes and maintaining a secure enterprise, says William Wong, principal of Logic Fusion, a network engineering and design firm in Yardley, Pa.

"It's going to take a long time to resolve the issue of distributing IP addresses and phone numbers outside the enterprise," Wong says. If a non-H.323 terminal calls into an intranet and can use dual-tone multifrequency tones, a server needs to be able to interpret those tones and perform PBX functions. Likewise, calling out from an IP terminal to a telephone presents a different scenario. However, good gatekeepers and gateways can resolve these problems.

A somewhat larger issue is the question of how to keep addresses hidden from the Internet. Proxy servers are going to be valuable for defining subnets or intermediate zones, Wong says.

Payment poses yet another obstacle. Until the commercial service providers have a clean and reliable way of billing for services, they will not be offering them. But Joe Aibinder, manager with IBM's Global Network, says his company is evaluating products for the time when conferencing-ready networks will be reliable and good business for his company.

Aibinder says IBM wants to offer a series of different packages for highly controlled applications, but must first determine how to make a profit and have the network and business infrastructure in place. People won't be mixing and matching products outside of the confines of these different controlled offerings.

Aibinder also is concerned about the network service provider being held responsible for all types of interoperability problems. Balkus concedes that H.323 products and technologies are in their infancy and don't always operate as planned.

"During the connection process, end points negotiate which audio and video levels the clients can support and users need," says Balkus. "Most of the major interoperability problems have been isolated through inter-op trials and other internal testing along the way. Once that hurdle is crossed, it's mostly a matter of making sure everyone sticks to the agreements."

"There will be minor hiccups along the way," Balkus admits. "But a good client should not drop a call, even if the network is overloaded." He believes the videoconferencing system should be able to recover gracefully if something happens.

Where to from here?

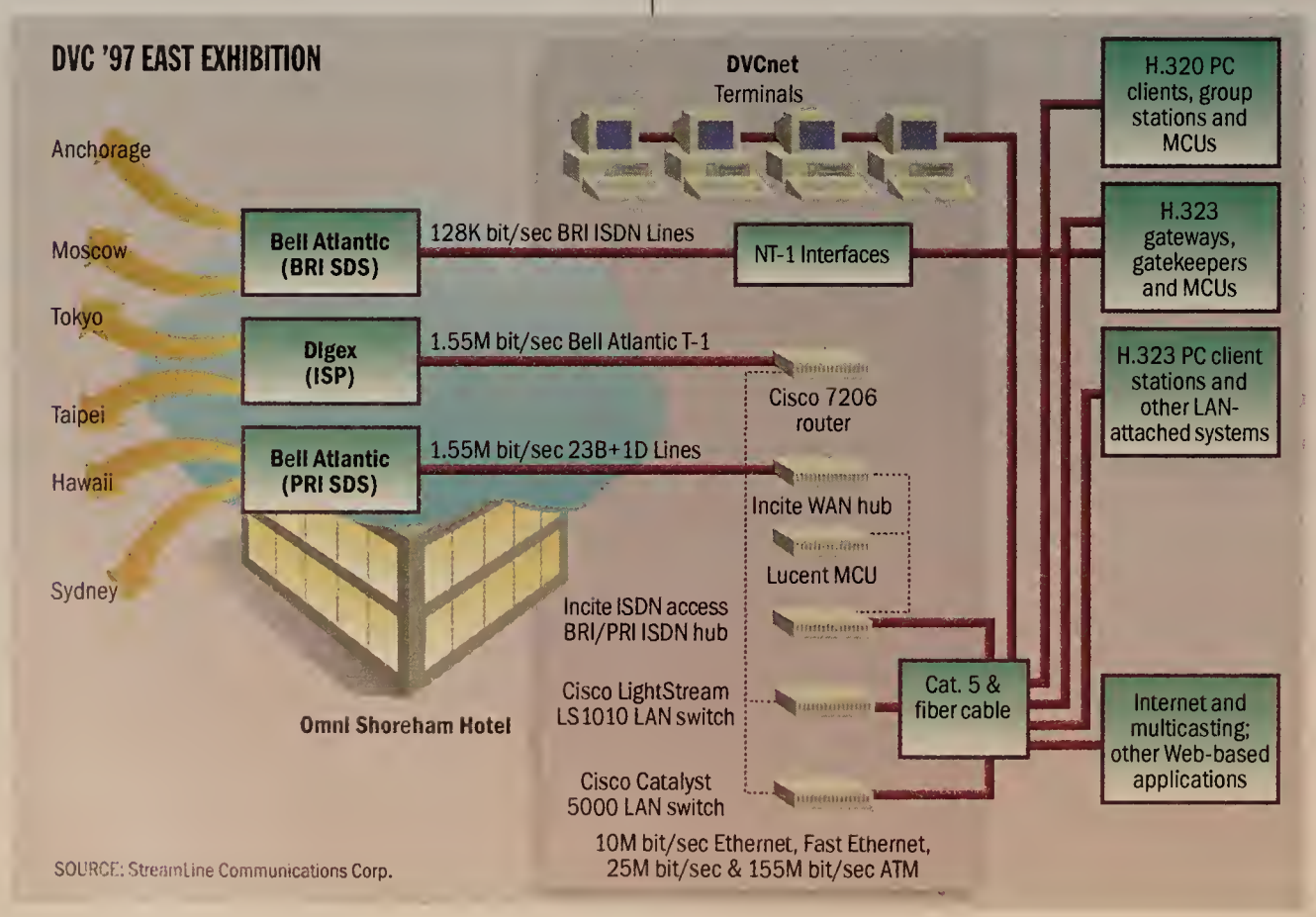
Sodergren plans to expand DVCnet at DVC '98 West to include all the major H.323 vendors' best products, most of which will comply with the second version of the standard. In the meantime, most of the developers and early adopters who shared their advice will continue their testing and evaluations, discovering new tricks and overcoming the challenges of migrating single-media networks to multimedia.

"One day in the near future, when the president of a company wants to broadcast his quarterly address to all his people and has heard that this can be done on the intranet, then maybe more network managers will feel empowered to go and try this out," Balkus says. And left to their own devices, users will experiment with these products to solve their business needs, most likely without the support or assistance of their network administrator.

Christine Perey is principal of Perey Communications & Consulting, of Placerville, Calif., a multimedia communications research and consulting firm. She can be reached at cperey@perey.com.

H.323 glossary

323 entity: Any component complying with the standard.
Endpoint: A network component that can place and receive calls. It generates and/or terminates information streams.
Gatekeeper: An H.323 entity that provides address translation and controls access to the network for H.323 terminals, gateways and multipoint control units (MCU). It also may provide other services.
Gateway: An end point that provides for real-time two-way communication between H.323 terminals on the packet-based network and other International Telecommunication Union (ITU) terminals on a circuit switched network or to another H.323 gateway.
Multipoint control unit: An end point that allows three or more terminals and gateways to participate in a multipoint conference.
Proxy: An H.323-aware proxy server that provides users on secure networks access to one another by relaying information that conforms to H.323 recommendation.
Terminal: An end point that provides real-time, two-way communication with another H.323 terminal, gateway or MCU.
Zone: The collection of all terminals, gateways and MCUs managed by a single gatekeeper. A zone may be independent of network topology and may comprise multiple interconnected segments.



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FEATURE

MANAGERS ARE UNDER INTENSE PRESSURE TO KEEP THEIR CASH-COW NETWORKS ONLINE

The stakes run high in the lottery game

Continued from page 1

Amazingly, the lottery's extensive networking equipment didn't perish, due to some quick thinking and a little preparation by the IS staff.

"We were thankful for the heroic efforts of the data center guys who, rather than running out of the building, grabbed some tarps they had on hand in case the storm caused the ceiling to leak," Beason says.

The workers removed all the computers' hard drives and brought them home for safekeeping. Relief organizations helped salvage other equipment. Meanwhile, BellSouth forwarded calls to the lottery's secondary site in Baton Rouge. Within seconds, the lottery was back online and operating out of its redundant data center, while the Port Allen site lay flooded under six inches of water.

While battling natural disasters generally isn't included in network managers' job descriptions, it's important to plan for the worst, Beason says. It's especially important when you're responsible for a network that supports a treasure chest of dreams — the lottery.

"When an ATM machine breaks down, you just prevent people from getting cash. But when the lottery breaks down, people perceive it as not being allowed to get the million dollars they think they would have won if the system was working," Beason says. "It's an image thing."

In the lottery game, the stakes run high for contractors such as GTECH, which operates roughly 30 of the country's 37 state lotteries. States also are working together to get a piece of the action through multistate games such as Powerball and The Big Game. The lotteries annually generate approximately $35 billion in sales, with most of the proceeds going to fund state budgets and special projects.

If the system breaks down, especially during a major drawing, political heads can roll. Similarly, as part of their contracts with the state, providers like GTECH are forced to ante up when their nets go down.

"We would have to pay an average of $1 million a day for failure to deliver a game, up to $10,000 to $20,000 a minute when the system is unable to sell tickets," Beason says. "Needless to say, there's a big incentive on our and the state's part to keep the systems running."

"We've had a few failures over the years due to a contractor accidentally digging something up," says Michael Collura, technical director for the Massachusetts State Lottery in Braintree. Massachusetts and Virginia are the only states that run their own lotteries.

"People understand if they can't get their tickets because there's a hurricane, but not if it's because there's a cable dug up," Collura says. "You can't explain to a guy running a liquor store who's doing $7,000 a day [in ticket sales] that it's all due to a cable being dug up."

Lottery operators say network crashes are extremely rare. More often, portions of the network, such as vending outlets at convenience and liquor stores, go down due to power outages resulting from bad weather.

However, like the U.S. Postal Service, lotteries are able to operate even in the most extreme circumstances, thanks to network redundancies and emergency power generators built into central data centers.

"We had an earthquake in Mexico that was a problem, but we had a lot of dedicated power to deal with it," Beason says. "There were some reports later that you couldn't buy milk but you could get a lottery ticket."

Sometimes it's humans, not earthquakes, that are to blame. "Operator error [in central offices] seems to have been the biggest problem," says Charles Strut, executive director of the Des Moines, Iowa-based Multi-State Lottery Association, the organization that oversees the 21-state Powerball game. "But now everyone has fully redundant systems. Everyone in Powerball is running triplex, with some running quadplex, like [they do in] Minnesota."

People understand if a hurricane prevents them from buying their lottery tickets, but they won't tolerate outages caused by a dug-up cable.

Michael Collura, technical director for the Massachusetts State Lottery

CHRISTOPHER FITZGERALD

Redundancy's the ticket

GTECH views redundancy as the most important factor in maintaining a safe and healthy network. Its lotteries all run on triple-redundant networks; the third network is used as either a back-up or test system. Its client states also maintain at least two geographically separate data centers. Texas is the biggest, with four sites.

"In Louisiana, we immediately were able to switch over to the second data center without missing a beat. That can take place almost automatically, within 10 seconds," Beason said. "It's the beauty of having triplex [networking]."

Massachusetts also has become a believer in redundancy. Started 25 years ago, Massachusetts' lottery was one of the first in the nation. For years, the state's lone data center ran on an aging VAX system made by gaming systems provider Autotote Corp. But lottery officials said operating the network was like driving across a creaky bridge — a nerve-wracking ride. The state legislature agreed, and this fall, Massachusetts will unveil its new $60 million duplex lottery network.

Massachusetts built a second data center in Norwell, anchored by Digital Equipment Corp. Alpha platforms running GTECH's PRO:SYS operating system, with Bell Atlantic Corp. digital lines ferrying data around the state.

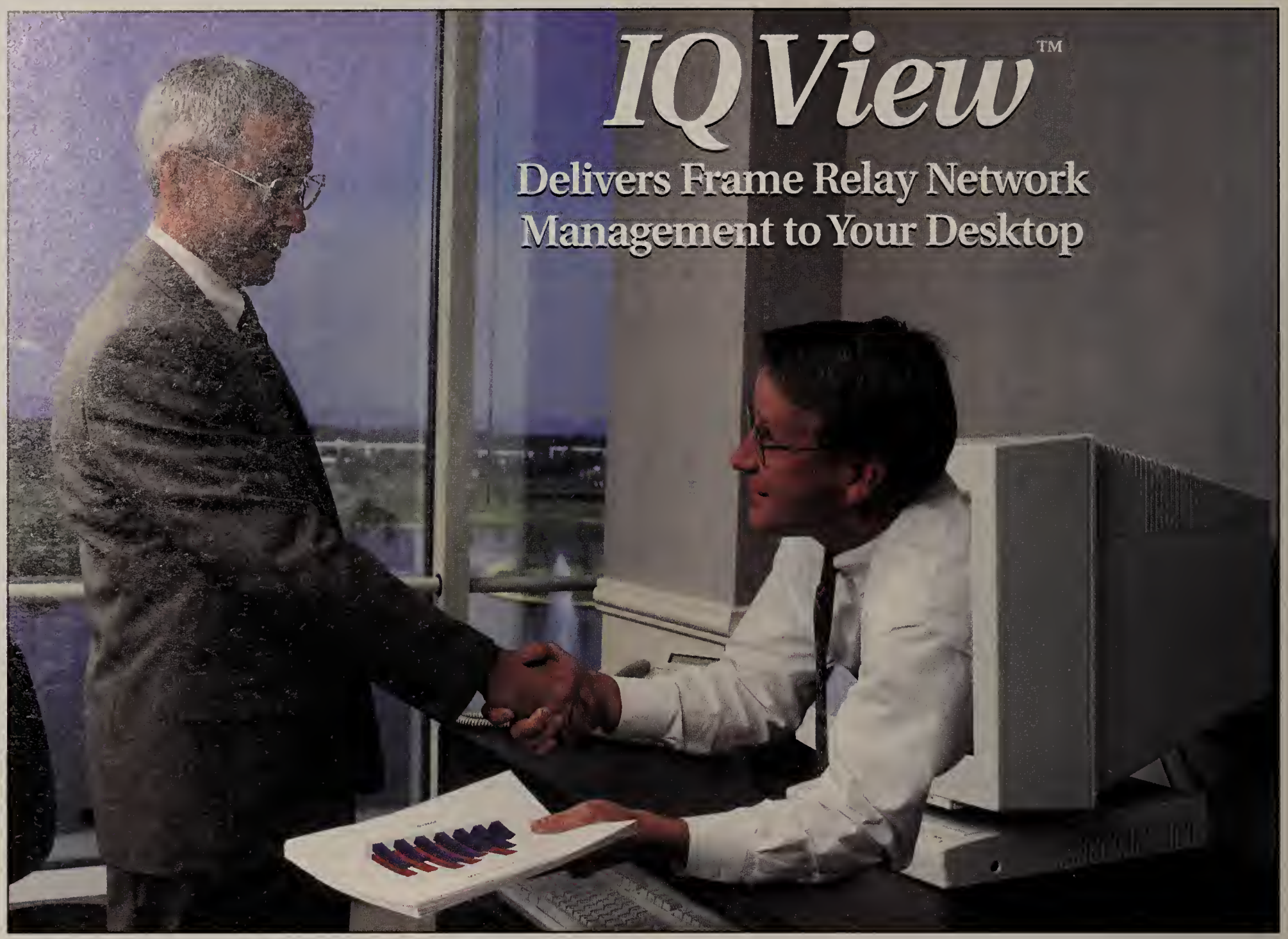
The lottery also is upgrading the primary Braintree infrastructure to create a duplex system of two simultaneously running networks with virtually transparent switching capabilities. The new network will be completely operational in early November.

Technically, most state lotteries have several things in common. Digital's fast Alpha chip and GTECH's PRO:SYS operating system are the platforms of choice not only in Massachusetts, but also in 30 of GTECH's client states.

Virginia, on the other hand, operates on a Stratus Computer, Inc. platform using software originally developed by gaming equipment provider Scientific Games, Inc. Most of the networks utilize Fast Ethernet switching but eschew ATM as futuristic and impractical.

"It's like with banks. You don't want to be on the cutting edge. You want the technology to be proven," says Eric Lew, a lead consultant on the Massachusetts upgrade project with the Boston-based branch of Deloitte & Touche Consulting Group.

"We'd be on the front page of *The [Boston]*



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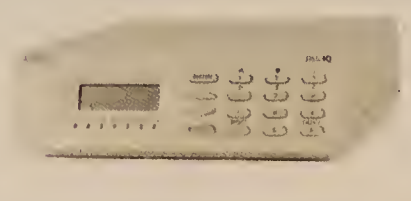

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Globe or *Herald* if we spent $60 million on a system and it failed," Collura adds.

Building a winning network

The biggest long-term investment for a lottery is communications, and IS professionals agree a solid infrastructure is the key to glitch-free operations. The trick is balancing the lottery's financial and geographic considerations with its telecommunications needs.

Most lotteries have had to think creatively when it comes to transmission options. Many networks utilize a combination of leased T-1 or T-3 lines, X.25, satellite and radio transmission. Ticket retailers generally transmit over low baud rates ranging from 1,200 to 9,600 bit/sec.

For example, GTECH operates a satellite system in rural New Mexico that uses very small aperture terminal satellite technology with a dial backup system. In Rhode Island, the company has used radio transmission as a backup to give the lottery more leverage

in negotiating its contracts with area carriers.

Meanwhile, Massachusetts uses microwaves to transmit to the western part of the state because it has not yet negotiated a contract with a carrier in that area.

Experts advise having at least two physically separate feeds into a data center, with each one connected to a different side of the carrier's ring. "That way, no matter where you take a cut, you can get to the loop. You'd have to have multiple failures for an outage," Beason says.

For this reason, lotteries like the one in Massachusetts that have been running on a lone line are now investing in backup lines.

"The worst feeling I've ever had was when we moved our headquarters a while ago to a new facility," Collura says. "The day before we moved, a contractor accidentally dug up the fiber but luckily only stretched it. If he'd broken it, we'd be out of business."

Collura says the incident convinced him they needed a second dedicated feed connected to a separate loop. "I called up NYNEX right away and said, I don't care what it costs I want a second feed in here, and I want it yesterday. Within hours, there was an army of NYNEX diggers in front of the office."

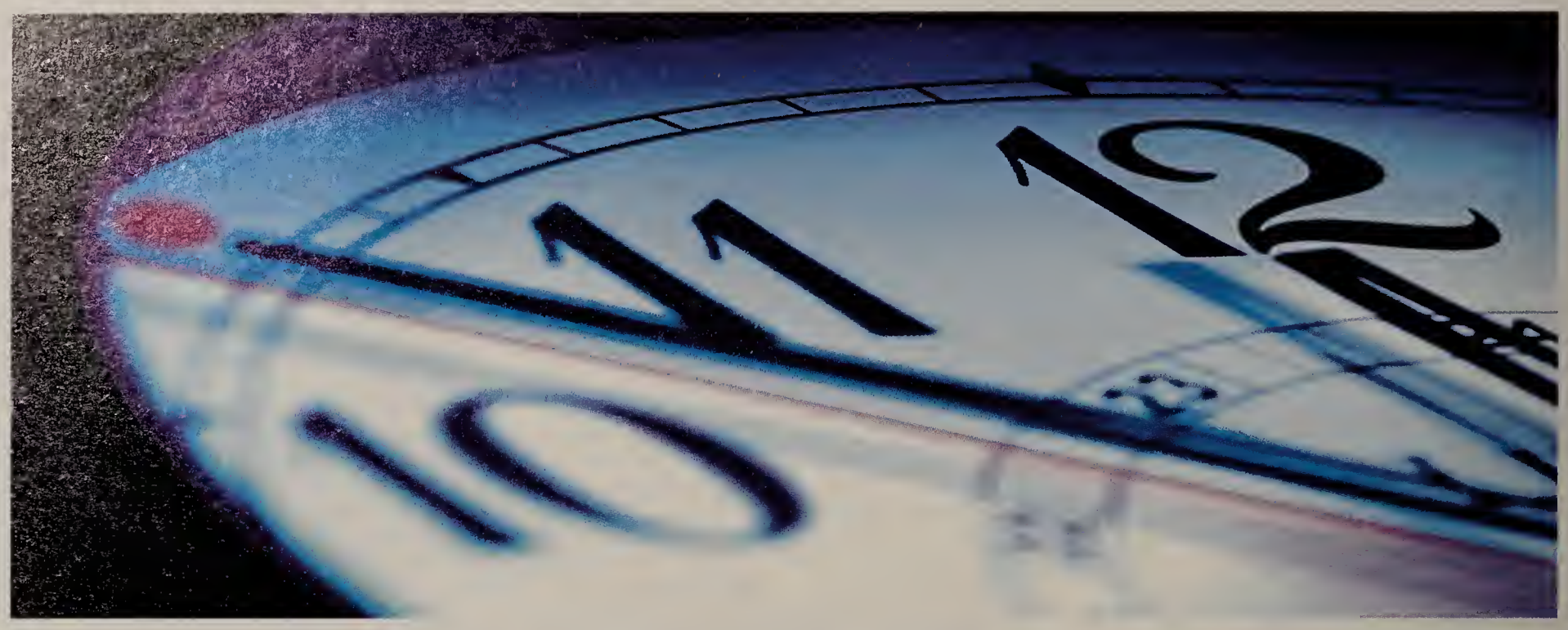
As it turned out, Collura's anxiety was well-founded. "As bad luck would have it, two days later, a lady drove into the pole in front of our facility and knocked out one feed."

Finally, lottery experts recommend spending the extra cash on fault-tolerant systems. Virginia, which has never had a network crisis, attributes its relatively spotless record to its investment in a Stratus mainframe with Reduced Instruction Set Computing technology.

"We're using machines that are being used by airlines and credit card companies like Visa. We had to pay a little more, but it's been worth it," says Cy Coleman, director of information systems for the Virginia Lottery.

Brickates is a freelance writer in Boston. She can be contacted at 72241.2053@compuserve.com.

Network performance analysis
every hour on the hour . . . automatically.



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No more waiting for performance analysis results once every 24 hours. RouterPM™ 3.0 is the industry's first performance analysis product that produces hourly analysis reports on critical network operations trends.

Now, within an hour of the first evidence of a potential problem, you can proactively handle any network performance issues identified in the RouterPM performance exception analysis reports.

RouterPM 3.0 also includes advanced diagnostics for Cisco Systems' enhanced SNMP management capabilities. The new version, with in-depth troubleshooting and diagnostics for router internals, plus media-specific diagnostics for every LAN port, dramatically reduces the need for RMON probes on all LAN segments.

Automated hourly processing

RouterPM data is analyzed every hour on the hour—automatically. Now, any time a user reports a network problem, you'll have the latest data at hand to spot the trouble immediately.

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Share your performance reports and trend graphs via the Web. Automatic reporting of user defined performance trends is available through a Java-based application that processes your requests. Using a standard Web browser, select your reports from point-and-click templates specifying on-demand, daily, weekly and monthly graph generation. Now, literally hundreds of automated graphs are available each day to help you anticipate and prevent network problems. And, these exception reports and trend graphs are easily viewed and distributed across multiple platforms using today's standard Web technology.

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We have added diagnostics for the internals of the router using the new memory pool and queue MIB's, as well as dramatically improved router LAN interface diagnostics for Ethernet and token ring. The new Ethernet and token ring LAN media diagnostics, combined with the FDDI diagnostics in RouterPM provide the equivalent of a monitoring probe on each router interface.

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RouterPM proactively detects router performance inefficiencies and provides specific, rules-based recommendations for correcting them. RouterPM acts as your round-the-clock, on-site network consultant that continually interprets SNMP data from Cisco Systems routers, allowing you to anticipate and prevent performance problems.

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REVIEW

ALERTPAGE LEADS THE PACK OF MONITORING PRODUCTS THAT KEEP AN EYE ON YOUR NETWORK WHEN YOU CAN'T.

Baby-sitting your network

By James Gaskin

A watched pot may never boil, but an unwatched network can boil over quickly. What better way to keep track of your network devices than to make them look after themselves?

We tested software that substitutes intelligent, active monitoring for the physical presence of the network manager. The premise is simple: Track network devices such as servers and routers and alert the right person when something goes wrong.

Most networks today are multivendor, meaning you need to support TCP/IP, NetWare and Windows NT all at once. All of the products work over TCP/IP networks, but, unfortunately, only Geneva Software, Inc.'s AlertPage and Caravelle Network Corp.'s GlobalWatcher handle multiple protocols. If WhatsUp Gold from Ipswitch, Inc. had NetWare support, it would be our top choice thanks to its wide array of features and entry-level price. As it is, AlertPage is our top choice thanks to its support of multivendor networks. WhatsUp Gold is a good choice for IP-only networks. Kaspia Systems Inc.'s Network Audit Technology is a complex program that uses SNMP to good advantage. And Caravelle Network Corp.'s Global- Watcher, while it supports more devices and has more notification options than the other programs, is hampered by the lack of a Web client and poor documentation.

Geneva Software's AlertPage

If your network includes NetWare servers, Windows NT servers and some TCP/IP devices, AlertPage was developed for you. You can monitor every server in your network without adding a single NetWare Loadable Module, Windows NT service or script of any kind to any server. You'll have to add a user named "alertpage" to the Novell Directory Service user list in each NDS container you want monitored. (A container is a virtual holding tank for network users and devices.) This is so the software can read the NetWare server error log files. But that's it.

Once installed, only the AlertPage software is known to the monitoring software — no other network devices are shown. The first icon in the upper left corner of the screen opens the Group Information page, with tabs to open the Device Groups, Discover IP Addresses, Discover ManageWise Devices and Discover Servers pages. You'll need to go through each of these pages and allow the software to find your network devices. Also on this page is a tab for Global Device Configuration, where you can set system details such as colors for device alarms and print a global device configuration report.

AlertPage searches a defined network segment for devices by pinging each address sequentially. A check box tells the system to resolve the host names. For our Ascend Communications, Inc. Pipeline 50 ISDN router, it showed p50.gaskin.com rather than the IP address; GATEWAY2K rather than the IPX address; and GW2K-NT rather than the NT NETBEUI address, making device identification simple. While each name requires a different name server connection, AlertPage handles all this under the covers.

The product's interface hides multiple features in all sorts of places (see Figure 1, page 72). The circular radar sweep indicator turns light blue when polling is active and red when polling is off. Clicking on any status icon or using the right mouse button in any of the Last Alarm Message sections opens an alarm history for that device. Polls are configurable to check every device at intervals from 10 seconds to one hour.

As implied by the second half of the name AlertPage, you can send a variety of messages via alphanumeric pagers. Configuration is straightforward, starting with naming a pager and entering its phone and ID number. Devices can be grouped, for instance, so one technician gets all the pages for the NetWare servers while another gets the pages for printers and Windows NT systems. A perpetual calendar grid is available, so you can define pager responsibility down to the half hour, with each pager designated by a different color.

AlertPage installation was fairly smooth. The manual references diskettes, but the software was delivered on a CD-ROM. There are two potential problems installing AlertPage on an NT server,

Score Card

	Discovery process (20%)	Naming and identification (20%)	Notification options (10%)	Protocol/service support (10%)	Web client display (10%)	Flexibility and ease of use (10%)	Security (5%)	Enterprise scalability (5%)	Installation (5%)	Documentation (5%)	Total score
AlertPage	10 x .20 = 2.0	10 x .20 = 2.0	10 x .10 = 1.0	9 x .10 = 0.9	10 x .10 = 1.0	9 x .10 = 0.9	8 x .05 = 0.4	8 x .05 = 0.4	8 x .05 = 0.4	8 x .05 = 0.4	9.4
WhatsUp Gold	8 x .20 = 1.6	7 x .20 = 1.4	10 x .10 = 1.0	8 x .10 = 0.8	10 x .10 = 1.0	9 x .10 = 0.9	8 x .05 = 0.4	10 x .05 = 0.5	10 x .05 = 0.5	10 x .05 = 0.5	8.6
Network Audit Technology	10 x .20 = 2.0	7 x .20 = 1.4	1 x .10 = 0.1	8 x .10 = 0.8	10 x .10 = 1.0	8 x .10 = 0.8	10 x .05 = 0.5	10 x .05 = 0.5	8 x .05 = 0.4	10 x .05 = 0.5	8.0
GlobalWatcher	8 x .20 = 1.6	7 x .20 = 1.4	10 x .10 = 1.0	10 x .10 = 1.0	1 x .10 = 0.1	8 x .10 = 0.8	8 x .05 = 0.4	8 x .05 = 0.4	9 x .05 = 0.45	3 x .05 = 0.15	7.3

Individual category scores are based on a scale of 1-10. **Percentages** are the weight given each category in determining the **total score.** The World Class Award goes to products that score 9.0 or better.

Net Results

	PRICE	PROS	CONS
AlertPage 3.61 *Geneva Software* *(800) 315-0952, (847) 562-0012* *www.genevasoft.com*	1 server, 5 ping devices — $795 3 servers, 15 ping devices — $2,195 500 users - $7,800	▲ Covers all network operating systems ▲ Multiple notification options ▲ Excellent name resolution	▼ Pricey for smaller networks
WhatsUp Gold 3.0 *Ipswitch, Inc.* *(617) 676-5700* *www.ipswitch.com*	Enterprise edition — $595	▲ Small footprint ▲ Easy to install ▲ Flexible display ▲ Multiple notification options ▲ Mini-Web server for easy viewing	▼ Less automated than other programs ▼ Weak name resolution
Network Audit Technology 1.2 *Kaspia Systems, Inc.* *(503) 644-1800* *www.kaspia.com*	Console — $5,000 Polling units — $100	▲ Quality SNMP console that costs less than Unix-based systems ▲ Reports galore	▼ Huge hardware requirements ▼ Multistep installation ▼ No notification besides the console
GlobalWatcher 4.1.2 *Caravelle Network Corp.* *(613) 225-1172* *www.caravelle.com*	25 devices — $495 300 devices — $1,295	▲ Multiprotocol monitoring ▲ Only system to watch NetWare volumes ▲ Multiple notification options ▲ Most hosts of any application	▼ Slow IP discovery ▼ Awkward naming devices ▼ Sparse and weak online documentation

both seemingly caused by Microsoft Corp. The AlertPage manual includes instructions for bypassing an open file warning that appears during every Windows NT installation. If you have Microsoft-shared components (from Microsoft Office) installed on your NT host, some Registry editing commands must be entered manually. If you run AlertPage on a Windows 95 system but want to monitor Windows NT hosts, you first must install NT Server Tools for Windows 95 from Microsoft.

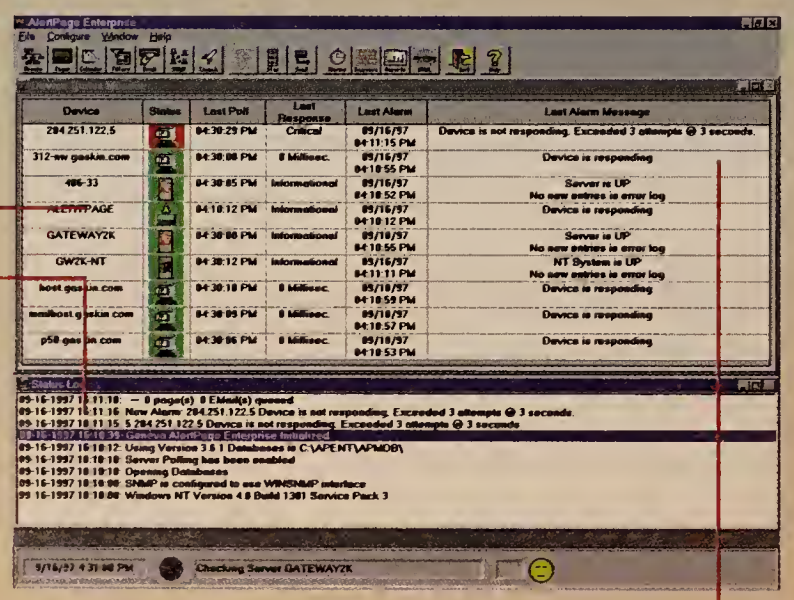
AlertPage 4.0 is available in beta, but wasn't ready in time for review. New promised features include the ability to monitor applications and track Web site performance, as well as better ties to existing e-mail systems such as GroupWise, Exchange and Simple Mail Transfer Protocol-based e-mail servers.

Ipswitch's WhatsUp Gold

WhatsUp Gold ships on a single 3.5-inch diskette, yet has a list of features and screens rivaling all the other packages discussed here. Installation is a snap, consisting of running "A:\INSTALL" and watching 20 files transfer to your system.

Network discovery happens automatically the first time you start the program. WhatsUp Gold is IP-centric and doesn't know quite what to do with NetWare servers it finds that are not running TCP/IP. In our network, it found and named the two NetWare servers (based on their NETBIOS support, no doubt), then reported they were not responding because neither would react to the Internet Control Message Protocol used by the ping utility. It can't manage NetWare servers in any way, shape or form. WhatsUp Gold is more aggressive about including systems on the far side of your Internet router than any of the other packages. This makes it possible to manage a WAN without putting remote stations on each network segment.

FIGURE 1



The top system is a Macintosh that's turned off during the probe.

Polls are scheduled by seconds, with the default set at 60. WhatsUp Gold uses several windows you can arrange, name and save to create different views (see Figure 2, page 76). The colorful status screen in the middle of the figure can be shrunk to a "small overall status window" that floats on your screen if you want only a small display.

As measured by the Windows NT Task Manager, WhatsUp Gold takes fewer resources than any of the other programs tested. You can easily run this program in the background on a Windows 95 system, because the ping polling sequence barely bumps up the CPU utilization of the host system.

If you want a map of your network resources, you must draw it manually, but WhatsUp Gold helps by showing standard Paint editing icons. Using the pop-up tools, you can draw lines, and move, delete and label icons. The tree list updates automatically.

You can configure every device individually for name, type of protocol used to poll, whether there are alerts used (including WAV files), a log, the services checked on the system (such as Domain Name System, File Transfer Protocol, HTTP and others), and device-specific notes. Ipswitch provides a clever "check every n polls" method, so you can poll some devices every minute and others every 5 minutes. You also may specify the time of day each device is checked, which is handy if you only want to monitor your print servers during work hours, for instance. Devices can be set to depend on other devices in the tree list, so a system may be polled only if another system is down or only when another system is up. If a router is down, that alert is enough; you may not want to see an-other alert for every single device behind that router.

Notification options include audible alarms, pagers (with text), beepers, voice messages (with a voice modem) and SMTP e-mail, or you can launch a program when an alarm is triggered. Message variables, based on the properties of each device, allow you to construct a fairly detailed error message including the system name, time, address, up or down and even any notes included. In e-mail messages, you even can list the entire log file for that device.

One of the slickest features is a tiny, built-in Web server that shows the list of monitored systems and their status. Clicking on any system opens a detail page about that particular device and gives access to the log file. This mini-Web server puts no appreciable load on the system while making the most-needed information available to everyone with a Web client.

Some automation that's available in other packages, such as DNS lookup and map drawing, is missing in WhatsUp Gold, but so is a big price tag. If your network is IP only, WhatsUp Gold is

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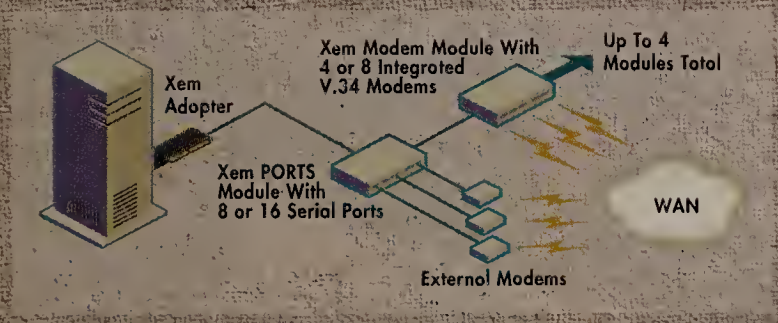

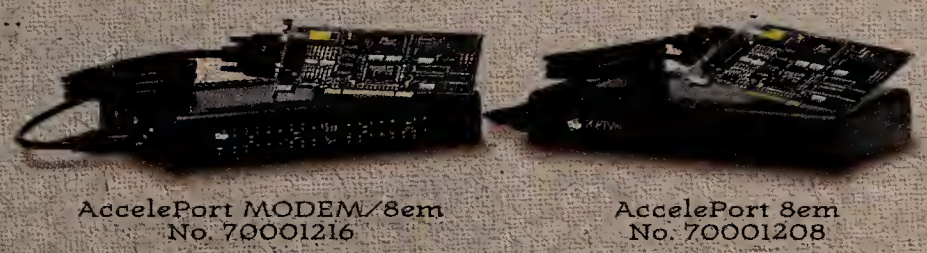

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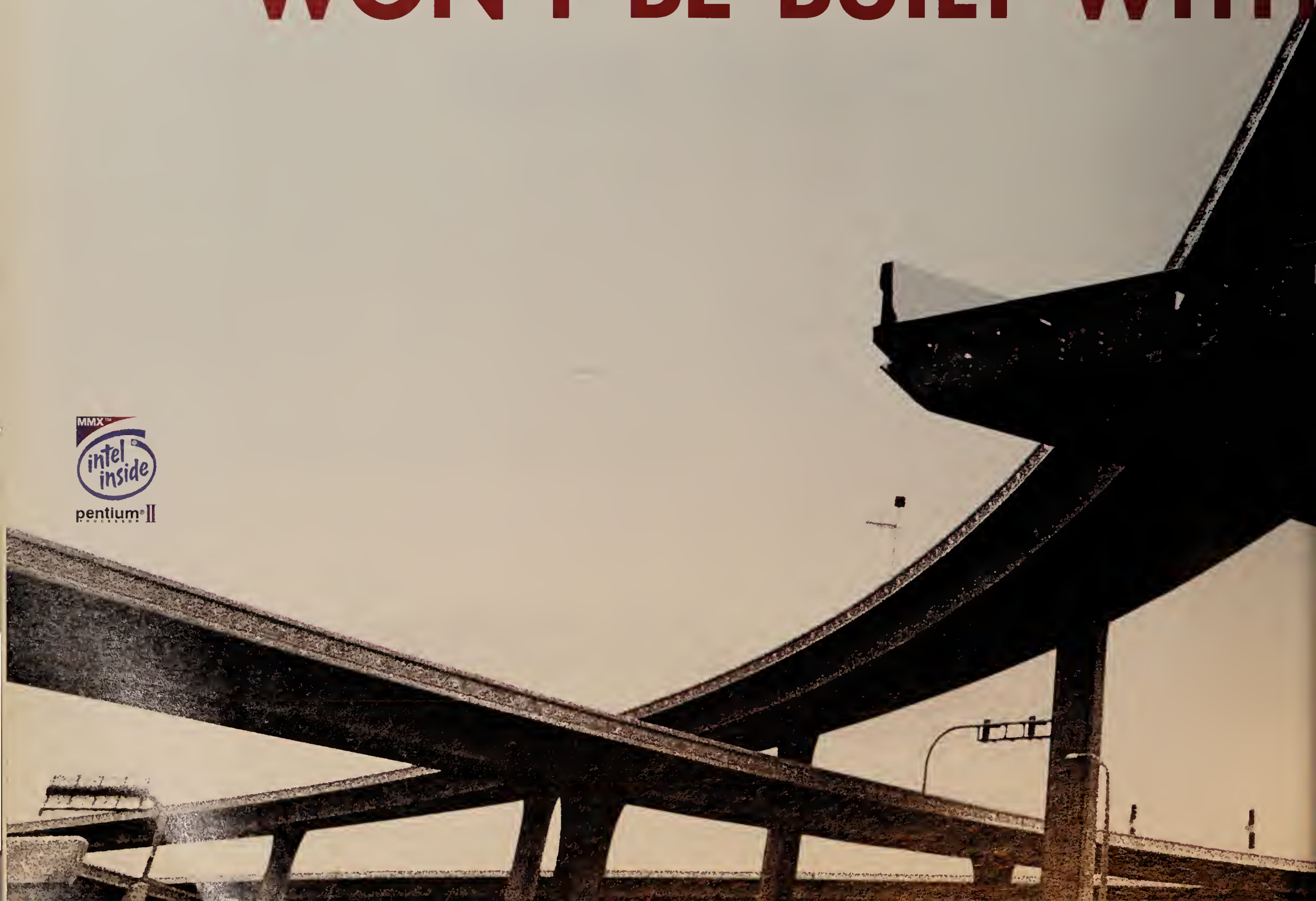

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Kaspia's Network Audit Technology

Kaspia's Network Audit Technology (NAT), formerly called Automated Network Monitoring System, is a large, multilayered program that monitors TCP/IP networks managed by SNMP. A Monitoring Console is your primary interface, with frame-driven Web client reports available in the Online Report Center, a graphical view of report format options (see Figure 3).

To discover devices on your network, NAT asks for the IP address of the nearest router, then queries the router tables for devices. Each new router found during the search is queried, as well, until all devices are discovered. Devices with SNMP support are verified by SNMP and IP. The first checks the health of the device and the second checks the network connection. Once the devices are listed in the database, you can change their names and descriptions quickly through the Monitoring Console.

Machines with SNMP agent software are polled at your discretion, and non-SNMP devices are checked with ping. The Enterprise Map screen shows routers and networks by default, but you can add critical devices. All network devices are displayed in a Segment Map that appears when you double-click a network icon in the Enterprise Map. Double-clicking on any item listed in the table opens a tabbed page of information about that device. Here you can change the name listed for the device, change the class (router, bridge, hub, server, switch, Remote Monitoring probe or workstation) and define the way the system displays its name and network details.

You want reports? NAT displays pie charts, bar charts, maps, tables and transaction lists for a specific device or an entire network segment. Report views are available from the Monitoring Console or through the Web interface.

Product installation is simple. You need IP and SNMP information during installation, but not NetWare and the Windows NT operating system information. That's because the package is for IP networks and SNMP devices only. NAT is so IP-centric it demands you remove all other protocols from the Windows NT box. We didn't and even let the NT system log on as a NetWare client, and the software ran fine.

Kaspia recommends dedicating a workstation to running this program, allowing it to constantly work monitoring the health of your network and verifying all devices are working. The company also requires a Microsoft Web server to be running for the report interface: Internet Information Server or the Personal Web Server if the program is running on Windows NT Workstation. You also need a Java-enabled Web client.

The manual is excellent and includes many full-color screen shots, although the installation goes so smoothly, you don't need to reference the manual.

This is a serious program doing a serious job, and it works well on large IP networks. If your company has SNMP management consoles more than a year old, the sparkle and polish of NAT from Kaspia may convince you to change consoles, as it supports a level of SNMP management once available only on Unix systems.

Caravelle's GlobalWatcher

Caravelle's GlobalWatcher is another strong multiprotocol product that tracks all the devices in your network and can track you down if one fails. There is less depth of information here than with some other programs, but it covers more devices and has more notification options than any other package.

Discovering the network takes longer with GlobalWatcher, partly because you search each protocol and server type individually. IP discovery was slower here than with any other product, too. On the other hand, you can save the configuration of all your NetWare disk volumes and print queues as lists, for instance, and reload a specific device list at a later date. Want to check printers? Load the printer list. Worried about disk volumes, routers or terminal servers? Define the list of devices you want to check and reload that configuration whenever you want only those specific devices tested and verified.

You can test for all listed devices or only selected devices. There doesn't seem to be a way to test more than one set of selected devices at a time, however, and the poor online help was no aid in finding one.

Polls can be scheduled for any time between a continuous loop and every 24 hours. The polling load on the host system is negligible.

Double-clicking on a device opens a tabbed screen showing other devices attached to this one, such as a server dependent on a router. Other tabs display notification history, test results and room for personal notes.

GlobalWatcher can notify you via screen messages, Messaging API or SMTP mail and by pager or modem. It also can launch a program when an alert is triggered and includes a calendar for associating the people to be alerted at given times to specific devices.

Installation is fairly straightforward, but we found one little glitch in running the software. When running on a Windows NT Server, GlobalWatcher couldn't make a connection to our NetWare servers. It worked perfectly from our Windows 95 PC, so we're inclined to think Microsoft changed something in NT Service Pack 3, rather than Caravelle making the mistake.

Gaskin is a network consultant and author in Dallas. His latest book is IntranetWare Border–Manager *from Sybex. Gaskin can be reached at james@ gaskin.com.*

FIGURE 2

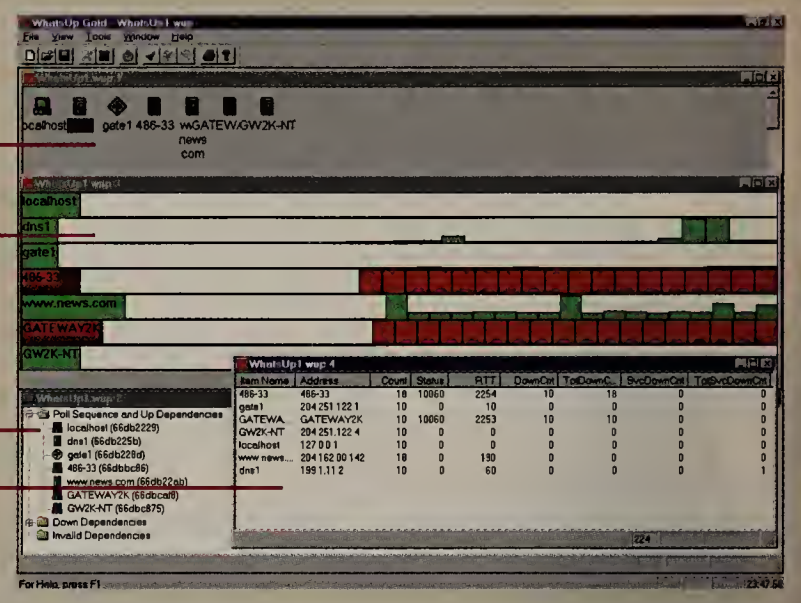
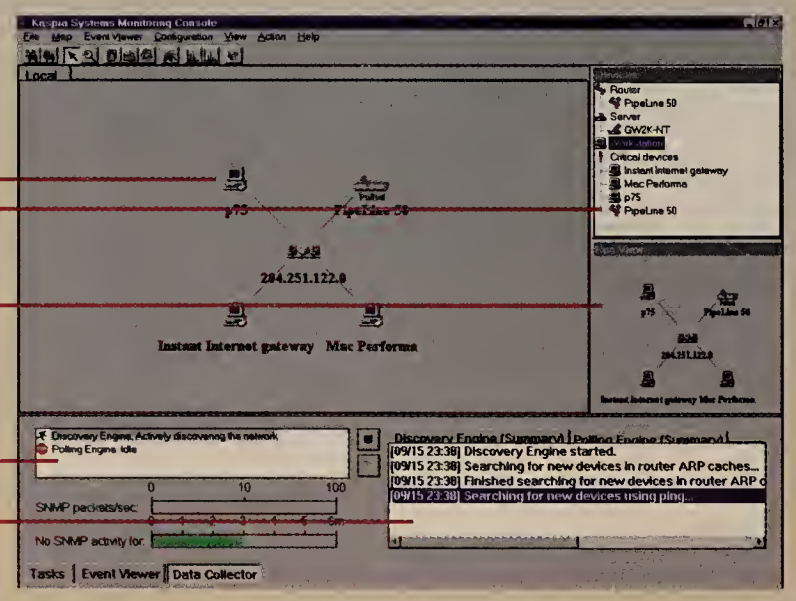


FIGURE 3



How We Did It

We ran each application under Windows NT Server 4.0 on a Gateway 2000, Inc. Pentium 120-MHz system with 32M bytes of RAM and a 3Com Corp. 3c509 10Base-T Ethernet card. An identical Gateway 2000 supported a Net-Ware server. Other devices included an Ascend Communications, Inc. Pipeline 50 ISDN router, an Instant Internet NetWare/Internet gateway from Bay Networks, Inc., several Windows 3.1 and 95 clients and a Macintosh Performa.

We installed each application, checked the local network, and used it to monitor network operations. We added and removed clients to test each application's response to changing network conditions. We set notifications and alarms to check how easy each product was to configure.

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Rx for burnout

Catch the disease early and alleviate it with communication, goal setting.

By Lucie Patrowicz

John West was a Cobol casualty.

West developed pension plan management software for Towers Perrin, an international management consultancy in Los Angeles. The job paid well, but each day brought urgent requests. His workload entailed constant coding and making adjustments for changes in government regulations and evolving client needs. West eventually tired of modifying the same product.

A Cobol programmer since 1982, West needed a new challenge. He wanted to keep up with developments in information technology, but was too busy fielding client demands. "I couldn't prioritize," West says. "It was always, 'We need it now.'"

West's frustration stemmed from classic causes of job burnout: projects that drag on, too little or too much challenge, difficulty prioritizing demands, lack of control over workload and a failure to receive recognition or appreciation for achievements. His burnout was fueled by an exhausting pace and fear of technological obsolescence, two symptoms shared by many IT professionals.

Ironically, West and other hard-working employees who seek fulfillment through their work are the most likely to develop burnout symptoms, says Dr. Kernan Manion, a stress management consultant and physician in Concord, Mass.

Burnout essentially is a motivational problem, says burnout expert Beverly Potter of Berkeley, Calif. It develops when a person loses a sense of control over his work life and succumbs to feelings of powerlessness or helplessness. This loss of motivation can manifest itself in a number of ways.

A perceptive manager can intervene before burnout causes serious damage. The first sign usually is fatigue, says Kathleen Greer, president of Kathleen Greer Associates, a human resources consulting firm in Framingham, Mass.

West spent two years programming at another firm, and rejoined Towers Perrin in 1990. Now Western regional leader of global technology support, West supervises six technical specialists who oversee the company's equipment and respond to help desk requests. He notices signs of fatigue when hardware or software upgrades require staffers to work especially long hours and meet ambitious deadlines. "I can see it in people's faces. [They're] more irritable, more easily upset," West says. "I try to give them a little time off here or there and find a way to slow them down."

Some companies, such as Continental Resources, Inc., of Mount Laurel, N.J., ease stress by hiring temporary consultants. The systems integrator hires high-tech temps to work at client sites during peak demand periods such as hardware or software installations or data center moves.

Establishing clear goals is another way to keep workloads manageable. Use a prioritized project list to assign work intelligently, Greer recommends. Team members also should have their own project and daily to-do lists. Many IT workers face overlapping crises and constant interruptions. They need to take time to evaluate each request, Greer says. Learning to say no can help them avoid taking on a task for the wrong reason — perhaps because it looks easy or a nice person asks for help.

John Shultz, systems management vice president at The Associates, a financial services company in Dallas, became the target of one talented workaholic's resentment. "He sent a flame-a-gram blasting me for pushing him so hard and giving him aggressive deadlines when he had actually developed his own deadlines and project plan," Shultz says. A reformed workaholic himself, Shultz was able to help negotiate a more reasonable pace.

It's important to meet with staff members regularly to discuss team goals and how individual efforts contribute, says Steve Homer, technical principal at Inacom Professional Services, a Dallas-based division of computer reseller Inacom, Inc. "Sometimes people get bored. They're buried every day with a big elephant they're trying to eat and don't see the importance of every bite," Homer says. "If you [say], 'Hey, you've got the lower left leg, George gets this piece, Mary gets this piece,' soon, hey, we did it!"

Remember to acknowledge progress and provide frequent feedback, Potter advises. Want expert advice in a nutshell? Communicate.

Shultz noticed a sharp decline in a staff member's motivation about a month after the worker took on a new assignment. "He wasn't there at 2:00 in the afternoon. A couple of times he wasn't in until 11:00," Shultz says. He finally sat the programmer down for a talk: The team was about to start a new project, and Shultz needed to know if the programmer was motivated to do it.

When the programmer learned he wouldn't always have to maintain existing mainframe code — a rather humdrum assignment — he turned around. "He got a month's work done in the last two weeks [of the interim position]," Shultz says.

When managers and team members build good relationships, employees are more likely to say what's on their minds and even suggest ways to solve problems, Homer says. Often, employees aren't asked for their input. Yet solutions to burnout problems may be surprisingly simple, Greer says. "Sometimes they might say, 'I just want to stop and take a C++ programming course,'" she says.

The key to good relationships is trust. "When you place your trust in good, capable staff, it comes back tenfold," says Shultz, who believes in management through empowerment, not dictatorship. If people aren't allowed to set goals and make mistakes, they won't try anymore, he says. Once a dictatorial style takes hold in an organization, it's hard to overcome. Likewise, when a culture is supportive, managers feel empowered to trust their employees to do their best.

In this respect, PC connectivity solutions vendor WRQ, Inc., of Seattle, is a great place to work. From the company's cofounders down, managers rely on workers' good judgment. "People have jobs to do, and we expect they'll get them done," says Mike Burgess, manager of enterprise communications. Burgess puts staff members in charge of their own work. They can, for example, arrange their schedules to accommodate their needs.

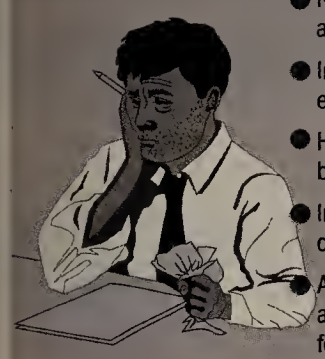
Respect builds good feelings. "We don't consider people just assets," Burgess says. "They're not resources, they're people." Managers encourage workers to care for themselves, their families and their communities. For example, showers, locker rooms and bike rooms promote fitness. WRQ also offers telecommuting options for some workers.

But flexible schedules and telecommuting won't solve basic performance or career problems, Burgess says. Flexibility can make people happier and more productive, but when there's a mismatch, a bad situation simply deteriorates more slowly.

Sometimes you should encourage an employee to move on. But good workers are hard to find, so it makes sense to retain them. Burnout is like an emotional heart attack, Manion warns. Like an acute health problem, it requires immediate attention.

Patrowicz is a freelance writer in Salem, Mass. She can be reached at patrowic@shore.net.

Six common symptoms of burnout



- Negative emotions, including dissatisfaction, frustration, anger and depression, usually accompanied by anxiety.
- Interpersonal conflicts, sometimes accompanied by emotional outbursts or withdrawal.
- Health complaints (colds, headaches, insomnia, backaches) and signs of fatigue.
- Impaired performance accompanied by boredom, lack of enthusiasm and/or impaired concentration.
- Abuse of substances such as alcohol, drugs, coffee, and cigarettes, accompanied by reduced or increased food consumption.
- A "So what?" or "Why bother?" attitude reflecting feelings of meaninglessness or cynicism, where once the person had been enthusiastic and dedicated.

SOURCE: BEVERLY POTTER, AUTHOR OF *Beating Job Burnout*

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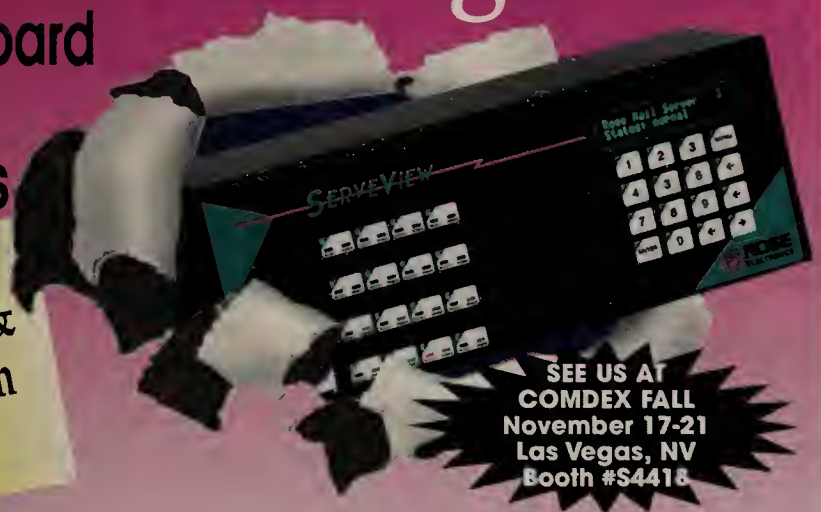

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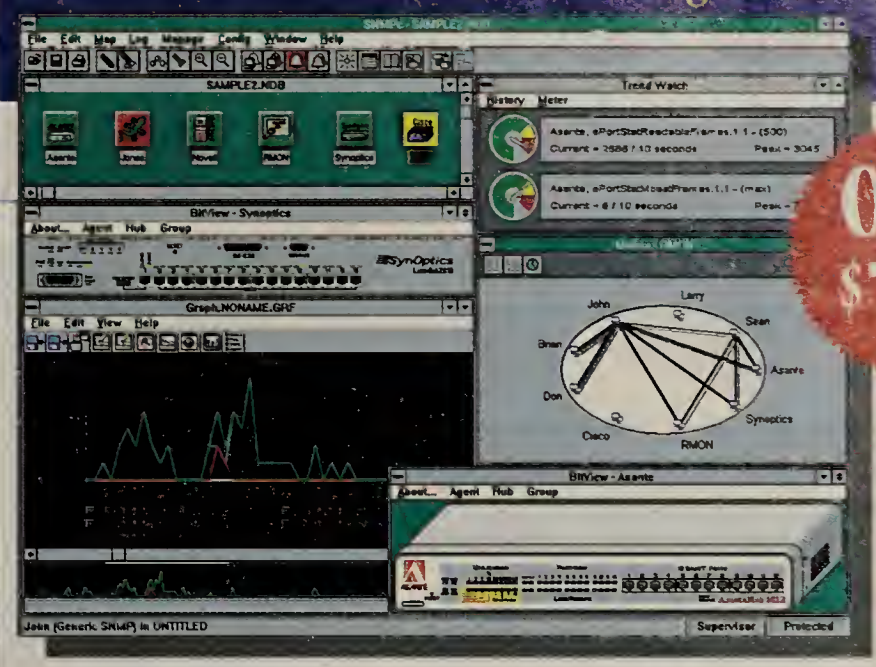

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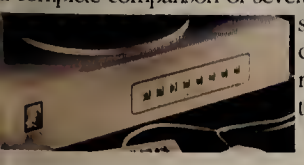

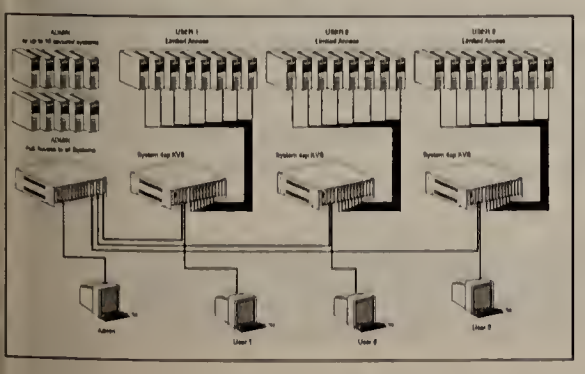

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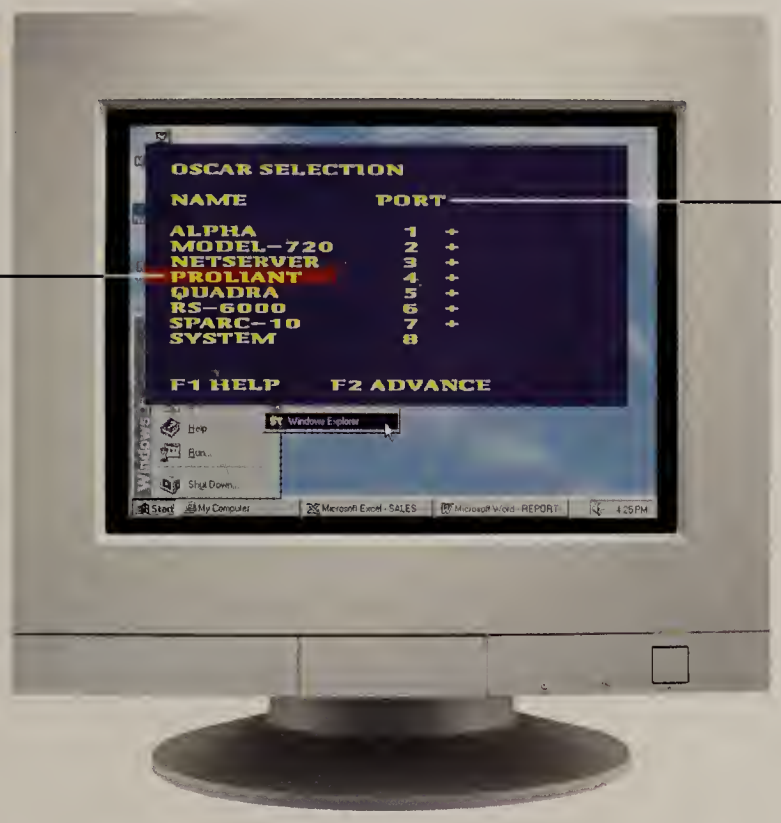

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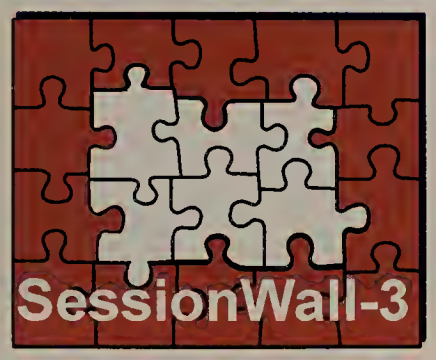

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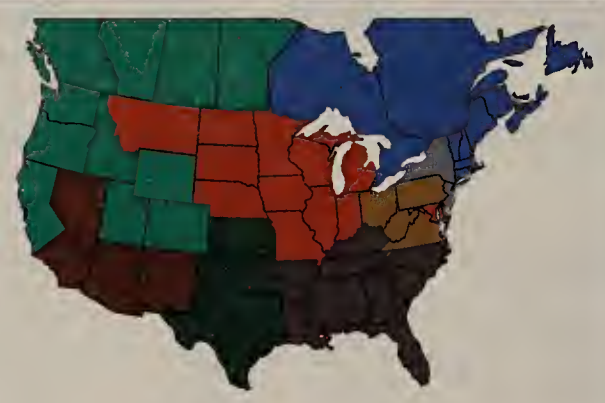

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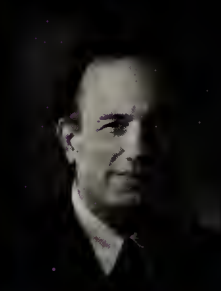

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GTE/MCI

Continued from page 1

panies that are bucking to enter the long-distance market.

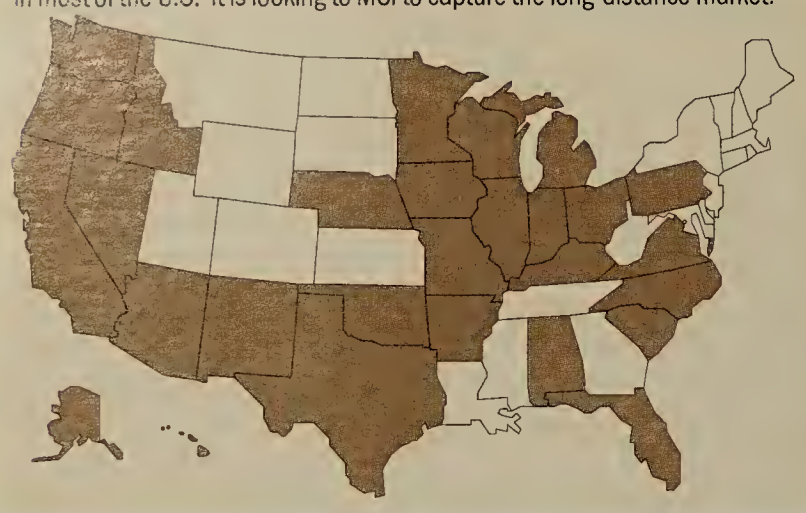
But most observers believe a WorldCom/MCI combo makes the most sense for corporate users with operations in large urban and suburban areas.

"GTE has so many of their own fish to fry, it's hard to understand why this would be a good merger," said Dan Taylor, senior analyst at Aberdeen Group, Inc., a consultancy based in Boston. "GTE does not have the best reputation for local service, and they are still trying to integrate BBN into their business."

A GTE/MCI merger could be a boon for users who have large operations in Tampa, Fla., Plano, Texas and Las Vegas or one of the many other markets GTE serves around the country (see map).

BT's looking for the whole pie

As shown in the shaded areas, GTE already has a stronghold in the local market in most of the U.S. It is looking to MCI to capture the long-distance market.



Best broadband bet

But the best bet for integrated broadband end-to-end services still seems to come from WorldCom. Its acquisition last year of MFS Communications Company, Inc., combined with its pending acquisition of Brooks Fiber Properties, Inc., gives it close to 75 local markets reaching city centers as well as fast-growing, densely populated suburbs with new employment centers.

"They have much better routes reaching the new office parks and campus environments," said Robert Rosenberg, president of Insight Research Corp., a telecom market research firm in Parsippany, N.J.

As for BT, it may just want out of this bidding war. Late last week BT waived a provision in its year-old merger agreement with MCI that had restricted MCI from discussing offers with GTE and WorldCom. And WorldCom is not expected to shy away from a fight for much-coveted MCI assets, such as its Internet backbone and additional investments in local facilities.

"I think [WorldCom CEO] Bernie Ebbers has a few more dollars in his pocket," Rosenberg said.

The Cisco connection

GTE still has quite a number of attributes to promote to MCI customers, management and shareholders.

"From the Internet point of view, an MCI/BBN/GTE combination can be extremely strong in the area of developing new value-added services," said Rebecca Wetzel, director of Internet services at TeleChoice, Inc., a Verona, N.J.-based consulting firm. "MCI's high-speed backbone and BBN's smarts at developing next-generation services could be a very powerful combination," she said.

Another factor enters into the picture: carrier network design. Both MCI's and GTE Internetworking's Internet networks primarily are made up of Cisco System, Inc. routers, said a GTE Internetworking executive who wished to remain anonymous. By contrast, the network owned by WorldCom Internet subsidiary UUNET Technologies, like those of many large ISPs, is primarily based on frame relay switches. It would be much smoother to join two networks that are based on the same technology from the same vendor.

Based on plans UUNET has for some pending acquisitions of its own, it most likely would not marry MCI's network with its existing frame relay network anyway. UUNET plans to operate ANS Communications, Inc., CompuServe, Inc. and GridNet International networks separately, migrating to a single backbone some time in the future. This would keep all of the existing network access points intact.

Ownership of transport facilities is another differentiator between GTE and MCI, but GTE is working to close the gap. While BBN, now known as GTE Internetworking, currently is not using its own transport facilities, it will next year. When GTE bought BBN it also purchased 13,000 miles of fiber optic capacity from Qwest Communications Corp. (*NW*, May 12, page 8). The fiber network still is being built.

In the meantime, GTE Internetworking is using long-haul transport facilities from three major services providers, one of which is MCI. That leasing cost could be cut if GTE owned MCI.

Last week the quest to become a bigger Internet player drove much of GTE's actions, while the search for local telecom facilities to provide Internet and private WAN access took on even more urgency just before GTE made its bid.

Earlier in the week, a panel of federal judges for a second time overturned Federal Communications Commission rules designed to help new carriers get into the local telephone business even if they do not own a local network. The court ruled that RBOCs have the right to force competitors to lease capacity on RBOC switches and local loops one at a time rather than in a package.

Favoring WorldCom

The decision against the FCC rules means carriers such as AT&T, with few local networks of their own, are going to have a tough time. It favors a WorldCom deal with MCI, since MCI needs to connect its 22 Synchronous Optical Network rings in city centers with the large metro-area rings and spurs built by WorldCom in order to provide metropolitan coverage, Rosenberg said.

Still, GTE may have an edge because of its experience in provisioning certain kinds of data services. Because it is authorized to offer long-distance service, it has an advantage over RBOCs still shackled by regulators' reluctance to approve their long-distance entry. For example, GTE offers both local and long-distance frame relay service at 56K bit/sec to 45M bit/sec.

It offers special construction ATM services in 14 states. And GTE's trials of asymmetric digital subscriber lines (ADSL) are among the most extensive being done by any U.S. local carrier.

Since June, users have been expecting GTE to announce general DSL services in three states, though expected announcements at recent trade shows have failed to materialize.

The blame is being placed on indecision about whether the service should be offered through the regulated local carrier, GTE Network Services, or GTE's newly formed competitive local exchange carrier, GTE Communications Corp.

Senior Writer Tim Greene contributed to this story.

So where do they get the money to buy MCI?

Two things are clear about the unsolicited offers made by WorldCom, Inc. and GTE Corp. to acquire MCI Communications Corp. The first is that both WorldCom and GTE are financially capable of pulling off such a deal. The second is that the steps they would have to take to do so could damage service quality to customers if they're not awfully careful.

The two offers actually are radically different. WorldCom's offer is based on its strength in the stock market, while GTE's offer is based on its strength in the bond market.

WorldCom is offering MCI shareholders $30 billion. It would parcel out the money at the rate of $41.50 for each share of MCI stock — which was trading below $30 a share before the WorldCom offer and has traded at around $35 a share since then.

But instead of actually forking over $41.50 in cash, WorldCom is offering the equivalent value in WorldCom shares. It can do so because WorldCom shares are worth 87 times the value of WorldCom's earnings this year, meaning that investors are counting on WorldCom to increase its profits dramatically in the future.

If it does not, WorldCom will almost certainly have to trim MCI's workforce.

WorldCom CEO Bernard Ebbers also is notorious for shunning business lines that do not make money in tough times. Some observers say that accounts for the company's recent drop in market share in frame relay — a fast-growing service that nevertheless has been a long time bringing profits to carriers.

By contrast, GTE is offering $28 billion in cash. Unlike WorldCom's offer, that number is in no danger of going down, since it is not based on the fluctuating value of a security. The figure could even go up if GTE and WorldCom — and conceivably others — get into a bidding war.

But GTE then needs $1 billion cash on hand. So it would have to get the bulk of the money by borrowing it on Wall Street in the form of notes or bonds bought by investors.

Some observers already have likened such a tactic to the big, troubled corporate buyouts of the 1980s. But there is a key difference, according to investment bankers. GTE's borrowings would not be considered "junk bonds," as were most of the notes floated in the 1980s for similar purposes. That is because GTE carries a high credit rating from Moody's Investor Service and Standard and Poor's Corp., meaning it can issue "investment-grade" bonds at lower interest rates.

The danger is that GTE would have to issue such a large batch of new debt that the credit rating agencies would grow antsy, said Robert Rosenberg, president of Insight Research Corp. in Parsippany, N.J. In such cases in the past, companies have often resorted to drastic cuts in expenses, leading to problems in product and service quality. But Rosenberg noted that GTE has one other option. Like most local telephone companies, GTE pays a large quarterly dividend to its shareholders — currently 47 cents per share, giving shareholders a 4.2% return on its stock even if the stock price stays the same all year. GTE could cut its dividend to help make the interest payments on its buyout loans, Rosenberg said.

— David Rohde

Recording industry gives 'Net music pirates a break

By Ellen Messmer
Washington, D.C.

Recording industry lawyers were supposed to teach 'Net music pirates a lesson they wouldn't soon forget. But it has not turned out that way.

Instead, the three alleged music bootleggers who last year got nabbed for illegally posting near-CD quality songs for download off the Internet will not face trial or pay monetary damages in a soon-to-be-announced settlement with the Recording Industry Association of America (RIAA). RIAA led the Internet piracy hunt on behalf of 10 big music labels, including Sony Music Entertainment, Inc. and Warner Brothers Records, Inc.

Instead of punishing the bootleggers, RIAA's Internet hunt appears to have hurt an innocent bystander. RIAA lawyers invaded the offices of ParSoft Interactive, Inc., a game designer in Plano, Texas, because RIAA online investigators spotted pirated music on ParSoft's Web site.

RIAA lawyers stormed in "like the Men in Black, slapped [down] a huge swatch of legal papers and said, 'You're running an illegal site,' " said Ron Dimant, ParSoft's business manager. "It was a week of hell and $10,000 down the toilet."

ParSoft was forced to pay legal and public relations fees to protect its reputation from copyright violation charges.

As it turned out, the individual who posted the bootlegged music was an employee of DFW Multimedia, the Internet service provider ParSoft used as its Web-hosting service.

According to several sources, the DFW Multimedia employee set up a subfile on ParSoft's Web site to post MP3 music files. The ISP employee also had added the illegal music to at least four other sites.

MP3, which offers near-CD quality digital recordings, is a file format that has been available for about a year. There is freeware, colloquially known as "ripping software," available on the 'Net that makes it easy to convert CDs to MP3 and post them on Web or File Transfer Protocol sites.

DFW Multimedia recently re-named itself 123 N.E.T. Officials declined to comment on the case.

RIAA lawyer Steven Fabrizio, who spearheaded the piracy hunt, said RIAA initially felt compelled to go after ParSoft because the Internet search presented no clues to the crime other than Web or IP address information.

Because of this, in each of the three cases, the RIAA began its court actions by naming computer IP addresses or Web servers as the suspects in court documents. As well as the ParSoft site, the IP address 208.197.0.28 and www.avalon.simplenet.com/coolmp3/music.htm became targets for investigation.

"We asked the court to grant a temporary restraining order and have the ISP stop access to the sites," Fabrizio said.

That ISP, Simple Network Communications, Inc., eventually delivered "Fresh Kutz," the pseudonym of one of SimpleNet's customers who used the ISP service to illegally offer a MP3 storehouse of Aerosmith, ABBA and other musical groups' songs to the world at large.

"They got a kid who was 17 years old," said SimpleNet president Robert Bingham. He said the RIAA has contacted SimpleNet numerous times to ask for information about the same kind of MP3 files Fresh Kutz had. Bingham said he will continue to cooperate but refuses to patrol his network for MP3 content.

Two out of the RIAA's three piracy defendants now are working for ISPs. The RIAA wants to keep their names secret, but the information is public as part of the court records (see graphic).

According to the RIAA, nearly 35 music-related sites, both legal and illegal, spring up on the 'Net each day. Today there is a total of 65,000 music-related sites that include streaming audio or radio broadcast. ■

SQUASHING MUSIC BOOTLEGGING ON THE WEB

The Recording Industry Association of America (RIAA), a trade organization for the music industry, in June launched legal actions against three people who illegally posted and distributed copyrighted music...

RIAA plaintiffs
- A&M Records
- Arista Records
- Atlantic Recording
- Capitol Records
- Island Records
- London Records
- Maverick Recording
- MCA Records
- Sony Music
- Warner Brothers Records

... but the three alleged music pirates will soon reach a settlement with the RIAA to avoid trial and payment of monetary damages.

Defendants
- "Fresh Kutz" aka Mark Shane
- "fwibbley" aka Paul Wilson
- "John Doe I" aka Brian Wolfe

S/MIME

Continued from page 8

browser and plans the same for an upcoming version of its Outlook e-mail client. But the company is mindful that Open-PGP may eventually win the IETF's blessing.

"We have the ability to quickly make a decision to add PGP, should that become necessary," said Scott Gode, product manager at Outlook.

While S/MIME and Open-PGP both have advocates, most corporate customers are simply hoping one or the other will gain the IETF's blessing.

"It really doesn't matter, as long as they get some kind of a standard," said Sam Scott, lead system programmer at Pier 1 Imports, Inc., in Ft. Worth, Texas. ■

Dinner

Continued from page 1

titive strategies and even the cost of commercial real estate. But at this NetWorld+Interop 97 get-together at La Grotta, a local Italian restaurant, discussion bounced from product shipments to customer deployments to pricing.

And, of course, Bay Networks, Inc.'s summer acquisition of Rapid City Communications came up a few times.

The one addition to our dinner guest list, Alteon Networks, Inc. CEO Dominic Orr, was not shy about letting his colleagues know that customer deployment of his company's gear has begun. "We've shipped 1,500 ports between [network interface cards] and switches," he said.

Extreme Networks, Inc.'s President and CEO Gordon Stitt also said the numbers look good. "I know of at least five customers who each have more than 10 switches in their sites running gigabit-to-gigabit switching," he said.

So far, customers seem to be using Gigabit Ethernet in the same way they initially used Fast Ethernet, said Joe Kennedy, vice president of Bay Networks and former president and CEO of Rapid City Communications.

"It's just the same thing as 100Base-T," Kennedy said. He was sporting a maroon polo shirt touting Bay Networks, the company that snapped up Rapid City Communications for $155 million. "Now they are deploying gigabit risers, gigabit link-to-link connections and gigabit NICs."

While all of our dinner guests agreed that the Gigabit Ethernet market will be big, they argued over just how large it would become.

"I would bet easily north of $100 million worth of Gigabit Ethernet ports in 1997," Extreme's Stitt said, between bites of salmon with pesto.

"Hmmm, at about $2,000 per port, that's about 50,000 ports," Kennedy pointed out. "Heck, even if you charge $4,000 [a port], that's still 25,000 ports."

Foundry Networks, Inc. CEO Bobby Johnson, Prominet Corp.'s president and CEO Menachem Abraham and Bay's Kennedy all thought $100 million sounded too high. The group settled on a range from 10,000 to 20,000 ports sold this year.

> *"One of the biggest Gig issues is around the server. The network is only as fast as the application appears to the user."*
>
> **Alteon's** Dominic Orr

Suddenly, our meal was interrupted when a party of five Cisco employees (including a couple of former Crescendo Communications, Inc. folks) entered the restaurant and were seated at the table next to us.

"Hey, we're forecasting the number of Gigabit Ethernet ports that will ship this year, so feel free to jump in," Abraham said to the Cisco clan.

But all five Cisco employees fell silent, perhaps because even after Cisco's $220 million acquisition of start-up Granite Systems, Inc. last year, the internetwork giant still is Gigabit-less.

PHOTOS: MARK ESCHER

> *"We are seeing a lot of customers who want to do switched 100M bit/sec Ethernet to the desktop, and once you do that, you need lots of Gig."*
>
> **Prominet's** Menachem Abraham

"But that Fast EtherChannel — now, that's the way to go," Stitt said, poking fun at Cisco's proprietary technology for aggregating bandwidth among multiple Fast Ethernet links and migrating users to Gigabit Ethernet.

Feeding frenzy

Speaking of Cisco, the Gigabit gang quickly moved the discussion to whether another acquisition will occur in this market.

"I predict there will be at least one before Interop [in Las Vegas]," Kennedy said, sipping Acacia Pinot Noir.

The others put on their poker faces and declined to divulge any tips, but Johnson said some days he gets a call every hour from investment bankers looking for him to sell. "I've yet to hear an acceptable offer," he said.

We wanted to know if our guests thought Cisco would have to make another purchase.

"It would be incredibly embarrassing," Stitt said.

'But that wouldn't necessarily keep them from doing it," Kennedy chimed in.

ATM attitudes

Packet Engines, Inc. President and CEO Bernard Daines, who was wearing a trademark bright yellow shirt, shifted the conversation toward ATM.

"Paine Webber had a report out on FORE Systems recently that talked about how FORE was doing better," Daines said. "They attributed part of the turnaround to the idea that the hype of Gigabit Ethernet was over and ATM was coming back."

That statement definitely stirred things up.

"Nobody is going to build an ATM LAN network from scratch today" Stitt said. "I just don't see it . . . not in the LAN backbone."

Alteon's Orr said he is not so sure about that. "There is a certain percentage of people who have made the decision to go [with] ATM, and they are going to stick with it," he said.

Kennedy broke into the discussion, saying "I have to wear my Bay hat here for a minute," which resulted in everybody else moaning and cutting him off. In fact, Kennedy took a fair amount of abuse all night long for "selling out" to Bay.

Quality conversation

Another key issue that came up was Quality of Service (QoS).

"I don't think QoS is a major buying consideration right now," Abraham said. "I just don't see the applications."

Extreme's Stitt, whose company emphasizes the QoS capabilities on its purple Summit boxes, disagreed. "It's a big buying consideration," he said. "Customers are using it to manage bandwidth."

While most of the evening's conversation centered around Gigabit Ethernet, it turned out that high-speed LAN technology was merely a sidekick to the real star in this market: Layer 3.

"I don't think Gigabit is the most important thing that's going on here," Kennedy said. "It's necessary, but wire-speed routing/switching is the key."

Everyone quickly agreed.

In fact, there was some disagreement regarding the value of Layer 3 vs. Layer 2 devices.

"There certainly will be a pricing premium over Layer 2 for a Layer 3 switch," Foundry's Johnson said.

Alteon's Orr predicted that 10M/100M bit/sec Ethernet prices will range from approximately $150 for a pure Layer 2 device to $600 for a routing switch port by the spring. Prominet's Abraham thought the high end would remain around $1,000 per port.

But Packet Engines' Daines shook his head. "You'll get very quickly to the point where people will not pay a premium for Layer 3," he said. "Most of the difference in pricing is who sells it, not what's in it."

> *"If you haven't gotten ATM under your skin by now, you probably are not going to."*
>
> **Bay's** Joe Kennedy

Daines contends that within a year the marketplace will not place a higher value on Layer 3.

But Bay's Kennedy disagreed. "That's like saying there is no price difference between managed and unmanaged devices," Kennedy said. "You'd only give away Layer 3 if you've never done it."

So, what's next for the Gig gang? Prominet's Abraham summed it up nicely.

"The test now is that we all must deliver a product in volume that really works and is deployed in real production environments," he said.

That's exactly why the guests at *Network World's* next Gigabit Ethernet dinner — scheduled for NetWorld+Interop 98 in Las Vegas — will be customers, not vendors.

Each of the six vendor executives already has committed to sending one customer to the meal to find out the real deal on Gigabit Ethernet. ■

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Search

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neously and returns only a small percentage of the most relevant hits. "There's a place for search services bundled into other search services," said Marc Krellenstein, director of engineering at Northern Light Technology LLC.

Because the human element does not allow search tools to scale well, you need a combination of tools that specialize, such as those geared toward experienced users and those for the basic consumer market, he said.

But Graham Spencer, chief technology officer of growing search site Excite, Inc., argued that start-ups are going to have a tough time because customers actually are looking for less specialization.

"Customers want simple," Spencer said, adding that larger sites provide content that smaller ones omit. Excite's buddy lists, e-mail features and stock quotes give customers a one-stop shop that other sites can't offer. "A year ago, the majority of traffic was search; now it's less than half of our traffic," he said.

But Krellenstein said that is exactly why the start-ups will succeed. "Search sites like Lycos downplay their search part," he said of the shift toward content by the major search engines. He added there is a need for pure search tools that cater to users with different levels of experience.

A stumbling block for start-ups has been and will continue to be creating traffic, according to developers.

Since traffic is what advertisers count on to justify paying for space on sites, generating it is priority one for most Web-site developers. According to Miller, the top 10% of advertising dollars spent on search sites goes to the more popular sites, such as AltaVista and Yahoo. ■

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General DataComm

WBEM

Continued from page 1

5.0, which is not expected to ship until mid-1998 at the earliest.

WBEM was announced in the summer of 1996 as a joint effort backed by BMC Software, Inc., Cisco Systems, Inc., Compaq Computer Corp., Intel Corp. and Microsoft and quickly garnered the support of about 70 other vendors.

WBEM products will "roll out with support for NT 5.0," said Wayne Morris, director of corporate strategy at BMC. "It's gaited by Microsoft."

That would make sense, since WBEM is viewed as a Microsoft-led initiative, despite its founding by five vendors and the fact it is expected to be operating-system independent like other Internet technologies. Microsoft concurred that WBEM products will roll out next year with the release of Windows 98, which is expected in the second quarter of 1998, as well as with Windows NT 5.0. The key, however, is NT 5.0 because it runs on servers, which is where "back-end" WBEM data-modeling services will reside.

Despite the lag, Microsoft maintains that WBEM is moving along at a faster clip than other standards efforts have in the past, such as the Simple Network Management Protocol (SNMP).

"We're really delighted with the speed with which the [Desktop Management Task Force (DMTF)] has set to the task of building the core component [of WBEM] and standardizing it," said Michael Emanuel, product manager for Microsoft's Systems Management Server.

The core component of WBEM is the Common Information Model (CIM), formerly known as the HyperMedia Management Schema (HMMS). CIM is the WBEM data model that defines how managed objects should be represented through a Web browser. The HMMS/CIM work was submitted to DMTF shortly after the WBEM initiative was announced.

Slow going for HMMP

Another WBEM component, the HyperMedia Management Protocol (HMMP), was given to the Internet Engineering Task Force (IETF) for further definition and standardization. HMMP is an HTTP-based protocol for communicating between management services, applications and agents.

The IETF hasn't done much with HMMP, though.

"The IETF has no activity related to WBEM and none is anticipated," said Michael O'Dell, chief technology officer for UUNET Technologies, and an IETF area director for operations and management.

"The focus has changed" with regard to HMMP, said Bob Meinschein, engineering manager for management technologies in Intel's platform architecture labs. "Defining a new protocol has proven troublesome, and it's going to take a long time to actually get it adopted in the market."

The new focus is on defining a way to make WBEM object requests protocol independent, Meinschein said.

Despite the drift away from HMMP, the WBEM product delays and the outcome of previous industry efforts — such as the Open Software Foundation's ill-fated Distributed Management Environment and the Management Integration Consortium — some see WBEM as perhaps the last best chance to finally achieve industry standard interoperable enterprise management.

"If this one doesn't succeed, we're going to run into some significant problems, which is going to slow down everybody's growth," said Stephen DeWitt, vice president and general manager of Cisco's network management business.

But others say the impact won't be that dramatic. Buyers want to know that network devices and applications have been tested, quality assured and work, said Joe Clabby, research director at Aberdeen Group, Inc., a consultancy in Boston. "But can I can get by without WBEM? Certainly," he said. ■

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WHERE'S WBEM?

Here's a look at the status of the Web-based Enterprise Management (WBEM) specification's three components.

Component	Description	Status
HyperMedia Management Schema	A data model for representing managed objects that is now called the Common Information Model (CIM).	Will ship with Windows 98 and Windows NT 5.0 in mid- to late-1998.
HyperMedia Management Protocol	An HTTP-based protocol for communicating between management services, applications and agents.	Still being debated within the IETF; considered dead.
HyperMedia Object Manager	An Internet-enabled version of Microsoft's OLE object broker that pulls together data on behalf of management applications.	Reference implementation available for informational purposes only.

WBEM defines a standard way to manage enterprise network resources using Web-based and other Internet technologies. Supporting vendors expect WBEM to generate a new breed of tools for reducing the cost and simplifying the task of enterprise network management.

Though a slew of Web-based management products have emerged since WBEM was announced, they offer little more than browser-based graphical user interfaces.

WBEM is supposed to go beyond this by providing a common data modeling environment that allows management applications to easily share data, something existing management platforms have failed to deliver.

But at the time WBEM was announced, vendors said products adhering to the specifications would ship by the end of this year (*NW*, July 22, 1996, page 1). And that is just not going to happen.

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Eight-way

Continued from page 1

"Some applications are running out of steam with four processors," said Bob Westerkamp, NCR's director of product marketing for midrange servers.

Vendors expect customers to use the eight-way systems to run data warehouse, decision support and other complex applications. The servers also might appeal to customers looking to reduce the number of boxes they need to manage and could even give some mainframe buyers reason to pause, observers said.

While some applications may need to be tweaked to run on eight-processor machines, emerging software such as a new version of Windows NT designed to run on eight-way machines indicates that software vendors are trying to make the transition a smooth one.

THE EIGHT-WAY SERVER RACE

The following companies have unveiled or plan to unveil servers with eight microprocessors:

- Compaq
- Data General
- HP
- NEC
- NCR
- Unisys

The leading eight-way server architecture will probably be from Corollary, Inc., a processor maker that Intel just announced plans to buy for an undisclosed sum. With Corollary in tow, Intel should be able to help server vendors get into the eight-way server market more easily.

Compaq already has agreed to deliver an eight-way server using Corollary's technology. Others building servers based on Corollary's design include Data General Corp., Hitachi, Ltd. and Samsung Electronics Co.

But HP — the first major vendor expected to deliver an eight-way Pentium Pro-based server — most likely will not base its offering on Corollary's design. Instead, analysts expect HP's machine to rely on an architecture from Axil Computer, Inc., which has been shipping its eight-way Northbridge NX801 server since March. Neither HP nor Axil would comment on their relationship.

HP, which expects to roll out its eight-way server by year-end, will base the initial release on Pentium Pro processors. However, the server will be upgradable to Deschutes, the code name for the next iteration of the Pentium II chip, expected sometime nextyear.

Among the other vendors preparing to enter the eight-way market are IBM, which, when the market is right, will add a version to its Netfinity server line. Dell Computer Corp. also will sell an eight-way machine but declined to provide further details. Also getting into the mix will be NEC Computer Systems Division, which has been beta testing its Express5800 eight-way system in Japan.

Most of the vendors expect customers to run Windows NT on their eight-way machines, though many of the systems also will support Unix.

Vendors said the eight-way machines will offer customers more than just power — the systems also will provide greater flexibility. For instance, customers will be able to partition some servers to devote processors to individual applications.

Then again, some analysts said eight-way servers could be overkill for most customers. "I don't even think four-way is that popular," said Laurie McCabe, a server analyst with consultancy Summit Strategies, Inc. in Boston. "The biggest growth is in two-way servers."

But the eight-processor machines might appeal to Unix users looking to migrate applications to Windows NT, she said.

One net administrator said he won't be rushing out to buy the Wintel eight-way servers. "If you're doing applications in Unix on a mainframe, I would not go to Intel-based servers," said Don Clark, client/server manager at Foundation Health Systems, Inc. in Rancho Cordova, Calif. "Give [the eight-way server] a couple of years and see if it's something you have a need for." ■

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Backspin

Real men should have real Web sites

The trouble with doing something right the first time is that nobody appreciates how difficult it was.

— Steven Wright

One thing that is not right is my Web site (www.gibbs.com). It takes brevity to extremes. If you should trouble yourself to take a look, you'll find a page with a logo and a link to a company I'm involved with. That's it.


Mark Gibbs

Of course, that's not all there is on the server, that's just all that's visible from the home page. Unlinked from the home page for reasons that are lost in the mists of time are a page wherein you can find out about the Intranet Business Group mailing list (www.gibbs.com/ibg.htm) as well as lots of private content generated for clients.

It was at lunch the other day that my good friend Jim Sterne berated me for not having a "real" Web site.

Jim was right. I do need to pep up my Web site but, as always, time has not been on my side. I've got a busy schedule and my Web site has taken a back seat in the face of that novel pursuit, making money.

But having thought about it, I guess it really is time to bite the bullet. And having just built a Web site (www.doughalter.com) for my friend Doug who is running for a seat on the Ventura City Council, it rather whetted my appetite.

Content is no problem. I plan to include all of my *Network World* columns, along with material that complements the features and articles I write. I also will include notes on products I've looked at but haven't reviewed on paper (which should please vendors and PR companies).

But the problem is: What should my site look like? Jim reckons it should be based on the Gibbs Institute that sometimes appears in this column. I rather like that as a motif, but what about the style?

Sure, I could do a simple site that could be browsed even with Lynx (the browser for the terminally geeky), but where's the fun in that? What I'll probably do is create two paths of access: Slow and way kewl or fast and plain.

What I'd like to include in the slow and kewl track would be a Virtual Reality Modeling Language (VRML) 2.0 world, but let me ask you: How many of you would be interested? Would it be wasted effort? My first attempts at this cast the Gibbs Institute as a sort of Roman temple with ironic columns and an array of globes inside, each with a different "world view."

For example, one globe is the Earth. Clicking on it brings up a control panel that allows you to select satellite photographs, weather data, surf reports, earthquake information and so on. (I need to rebuild this one from scratch, as a disk corruption trashed my, ahem, un-backed-up, model.)

Make no mistake, these things are hard to build and if you want to see what sophisticated designers can do with VRML, check out Construct, Inc., at www.construct.net. Go to their projects section and take a look at "Crutch" — a brilliant art piece with a strange, surreal narrative. This piece and the other samples of their work show how far VRML has come.

Microsoft also is getting into this area in a big way — check out www.microsoft.com/vrml. Curiously,VRML models are demanding of the client system, not bandwidth, and some of the VRML banner ads you'll find at Microsoft and Ligos Technology (www.ligos.com) are very impressive. But, I digress (and without tags). . . .

So, you tell me: What should my Web site look like? Do you think VRML is cool and I should use it? Do you think I should have audio and video streaming? Should I include a forum system?

Let me know at nwcolumn@gibbs.com or opine at (800) 622-1108, Ext. 7504.

'Net Buzz

The latest on the Internet/intranet industry

By Chris Nerney

MAKING YOUR SEARCHES SAFE FROM SPAM So you're working at your cozy little desktop, acting like the good 'Netizen that you are, when suddenly your life is turned upside down by an insidious, unprovoked spam.

At least that's the way you make it *sound*, you big, whiny baby. Try getting 10,000 spams a day. That's what happens at **Digital Equipment Corp.'s AltaVista search service,** according to **Barry Rubinson,** AltaVista's engineering director.

Rubinson says the search service receives 20,000 URL submissions daily, "of which nearly half are pure spam."

More precisely, they are "index spam," which manipulates search results by planting hidden, bogus information in Web pages and title fields in order to draw visitors who normally wouldn't visit a specific site.

That's why when you search for words like "football" or "Einstein," you'll sometimes find among the returns a link to "Pete's Porno Palace" or some such Web site. You, of course, are stunned. And outraged.

In an effort to combat index spam, AltaVista last week began implementing software designed to detect spam and exclude it from the index. Web pages flagged by the software as likely spam-carriers are then pulled aside for a withering interrogation by jackbooted AltaVista toughs. At least that's our interpretation of the technology.

AltaVista officials say frequent violators will have their Web sites permanently banned from the company's index. Now *that's* how you handle spammers.

BRIGHTWARE LOOKING $11.6 MILLION BRIGHTER Internet direct-sales software start-up **Brightware, Inc.** has just closed its second round of venture capital financing, grabbing $11.6 million from a group of investors.

Leading the round was new Brightware investor **Advanta Partners LP,** which joined original investors **Norwest Venture Capital** and **Venrock Associates.** Other new investors include **Hambrecht & Quist** and **TTC Ventures.**

The Novato, Calif.-based company was a division of **Inference Corp.** before spinning off on its own in May 1995.

Brightware recently launched Brightware 1.0, a sales server with an inbound marketing agent that actively solicits questions from Web visitors to turn them into sales leads.

While online businesses may find the notion attractive, we're not sure we relish being pounced on by a sales agent immediately upon entering a Web site's portals. Hey, if we want that treatment, we'll go to **The Gap.**

NOVADIGM LAUNCHES RADIA **Novadigm, Inc.** may be best known as the company suing high-profile push technology vendor **Marimba, Inc.** for alleged patent infringement.

The Mahwah, N.J.-based software firm in March sued Marimba over a technology called "fractional differencing," designed to speed the delivery of information over the Internet.

The suit attracted little attention until August, when Marimba submitted a standards proposal to the **World Wide Web Consortium** (W3C) that Novadigm said was based on technology it patented last December. Not eager to become entangled in a lawsuit, the W3C quietly has been trying to broker a settlement.

Meanwhile, as the legal system and standards process work their glacial magic, Novadigm has announced a new product for managing software, content and applications over the Internet and intranets.

The product, Radia Software Manager, breaks software, content and applications into "active" components that can be managed based on individual user needs and the requirements and limitations of each user's desktop, Novadigm CEO **Albion Fitzgerald** says.

This component model is more efficient and precise than the cloddish, "one size fits all" approach taken by push technology, Fitzgerald says. (All right, we added the "cloddish" part, but we know what he's thinking.)

Radia Software Manager for Windows NT will be out in December and will cost $15,000 per server. Unix and Macintosh versions are due out early next year.

Got a good tip for 'Net Buzz but don't know how to proceed? Don't worry, our helpful marketing agents will guide you through the process. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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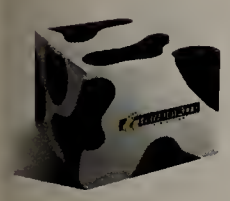

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